The Province of Alberta

PETROLEUM AND NATURAL GAS CONSERVATION BOARD

Application for Permission to Remove or cause to be removed Natural Gas from the Province of Alberta, under the Provisions of the Gas Resources Preservation Act by Northwest Natural Gas Company and Alberta Natural Gas Grid, Ltd.

I. N. McKinnon Esq., Chairman

D. P. Goodall Esq.

Dr. G. W. Govier

Session: JUNE 1st, 1950.

Volume 6

I N D E X

VOLUME 6

June 1st, 1950.

W I T N E S S E S

E X H I B I T S

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VOLUME 6.

June 1st, 1950.

JAMES F. BELL, having been duly sworn, examined by Mr. Nolan, testified as follows:-

MR. NOLAN: For the information of the Board and counsel I am introducing now a brief entitled:"Portland Gas & Coke Company" through the witnesses Mr. Bell and Mr. Cook. Mr. Bell will speak generally on the policy of the company and Mr. Cook will present the written document.

THE CHAIRMAN: Before we go on with the Portland Gas & Coke Company, Mr. Nolan, I think you said yesterday that the President of the Seattle Gas Company would be available for cross-examination?

MR. NOLAN: Yes.

THE CHAIRMAN: Do you wish to proceed with the Portland first?

MR. NOLAN: It would suit my purpose better if that course were followed and I will tell you why. The gentleman about whom you are speaking, Mr. Gellert, is President of the Pacific Coast Gas Association. He is at the same time President of the Seattle Gas Company and he will be here to be cross-examined on any matters arising out of the Seattle Gas Company brief. But over and above that he will be able to speak to the Board on the policy of this larger body which is known as the Pacific Coast Gas Association, and for that reason I desire to call him later in the case. He has no objection to that and if the Board has not, I would like to follow that course.

THE CHAIRMAN: Very well.

Q MR. NOLAN: Mr. Bell, you have been sworn?

A Yes, sir.

Q And what is your full name?

A James F. Bell.

Q You reside in the City of Portland?

A Yes, sir.

Q And you are associated, Mr. Bell, with the Portland Gas & Coke Company?

A Yes, I am.

Q How long have you been associated with it?

A For 4 years.

Q In what capacity do you act?

A I was first Assistant to the President, and I am now Vice-President of that company.

Q In a word, what does your company do?

A The Portland Gas & Coke Company is engaged in the manufacture and marketing of gas in Portland and the adjacent area.

Q And that adjacent area, as we shall be told by Mr. Cook, is a large area, is it not?

A Yes, we serve approximately 81 towns and communities in the Willamette Valley and Vancouver, Washington, in addition to the metropolitan Portland area.

Q Yes?

A The company, I might say, has been engaged in the manufacture and distribution of gas in that area since 1860, about 90 years.

Q And the gas that you sell is artificial gas?

A It is manufactured gas. It is manufactured from oil.

Q And the oil comes from?

A From California by tank steamer.

Q In that manner it is not altogether unlike Seattle, except

that in Seattle they just supply the metropolitan area of Seattle?

A Yes.

Q And the area you serve is a very large district?

A It is.

Q Mr. Bell, you were requested by the applicant company to come before this Board and make a statement of policy with respect to your company, with respect to the importation of natural gas from Canada into the State of Oregon. Would you be good enough to state that policy for us?

A The Portland Gas & Coke Company looks forward with confidence to the future of the gas industry in the territory which we serve and we understand that you here have a supply of gas over and above your requirements. But we recognize that before we can go to a pipe line company for a supply of natural gas to Portland that there are some conditions that will have to be fulfilled. We would have to be assured of adequate reserves to back up the supply that we expect to receive. We would also have to be assured of long-term delivery and we should also have to be assured that we could get this gas at a reasonable price. At a price, of course, that would return to the pipe line company a reasonable profit and a reasonable return on their investment.

MR. NOLAN: Thank you.

CROSS-EXAMINATION OF THE SAME WITNESS BY MR. FENERTY.

Q Mr. Bell, just what do you mean by "adequate reserves"?

A Mr. Fenerty, I am not qualified as an expert upon the definition of reserves but in the ordinary common sense I would say that we would have to rely upon some well known and well established expert in these matters. But if the

pipe line is permitted to sell your gas we feel that we could rely then upon the supply of gas that may be dedicated, say, to us for 20 years.

Q I was just wondering what you meant by that "adequate reserves". Do you mean reserves that are adequate at the date you make your contract or reserves that may be adequate 100 years hence? What do you mean by "adequate reserves"?

Q Well, we will use the general term, "adequate".

Q I am using the term you used. What do you mean by it?

A I would mean adequate at the time that we signed the contract.

Q You are unlike the B. C. Electric who are content to rely on something that might be developed in the future?

A Mr. Fenerty, my answer to that question would be we would have to rely on the judgment of all the experts on these matters of reserves, including probably some representative of our own, as to what the amount of the probable reserves will be and if they could be safely considered as adequate for our work.

Q I understand that you can only take the estimates of experts and they are necessarily matters that are not absolutely calculable because natural gas, you cannot block it out like you do quartz in a gold mine or coal. But you want a reserve supply established now and you are not willing to rely on the possibility of other reserves some years hence. You want the reserves that we know of, blocked out and proven for your supply?

A I would like very much to give you a specific answer to that but I do not feel I am qualified to do so. Perhaps I might clear up my position by saying this, that as I understand this situation, you may have a field that has been

completely drilled and the reserves blocked out as carefully as they can be without actually producing them.

Q Yes?

A That certainly would be considered an adequate reserve from my point of view.

Q Yes?

A On the other hand, a reserve from a field which had not been discovered as yet would certainly not be an adequate supply for my personal point of view. The gradations between a field that is completely drilled and a field that has been been discovered - -

Q MR. NOLAN: A field that has not been discovered.

A Between a field that has been completely drilled and a field that has not been discovered, I am in a position to state that we would not consider the latter an adequate reserve.

Q MR. FENERTY: And when one gets down to contracts you must have an assured supply?

A That is correct.

Q And who is going to satisfy you on that?

A I would say that we would be guided in part by this Board and in part by all other Boards and in part by possibly experts whom we will retain when the time comes to investigate the matter thoroughly.

Q Does it come down to this, that you are satisfied with whatever direction may be given as to where you get your gas?

A I do not understand that question, sir.

Q I will tell you what I am driving at. I am trying to pin somebody down to something. It may not be you, you know, but I would like to talk to you about it for a while. I have an idea - I may be wrong, I probably am - but I think that

in order to have export gas somebody has got to come up and show contracts in which gas will be obtained from what we have been calling "proven reserves", "producing fields", fields where we know where the gas is and we can get it out of the well. I think that before there is an export from these same sources of supply, the local consumption must be guaranteed a supply in priority. It may be that we will find that there is a sufficient supply for both. In order to find out that, I am trying to find out where you people who say you must have an adequate reserve will expect to get the gas from. You do not know that and that will have to be left to someone else who will be heard, but I do not want you popping up later and saying "I think these are adequate and I think these are not". Are you going to determine, at some time before we are through, when your reserves are adequate?

A Yes, we will absolutely determine to our satisfaction that the reserves that are supposedly dedicated to us at the time, when it comes, are adequate for our purposes. My problem is the same as yours. You want your people here to be supplied with adequate reserves of gas.

Q Yes?

A We have no desire to do anything that would prejudice their supply of adequate reserves. By the same token, when you and your people have adequate reserves there may be some gas for us and the people in our territory and we, as a distributor of gas, want some assurance of gas, want the same assurance you want. That the reserves for our system at that time are adequate.

Q Then you want to get your supply from the same reserves that

we want to get ours?

A Not the identical reserves that you want.

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Q So that there is no certainty as to what your position will be until you have determined at some time in the future whether the sources of supply which have finally been settled on are adequate for your purposes after consulting your experts, is that right?

A Yes.

Q I am still trying to get hold of something that somebody can tell me today. So far I just can not get anywhere with anybody as to what you are going to do, and perhaps the situation comes from the uncertainties with reference to natural gas, but I understand your position. Thank you.

A May I add one statement, sir?

Q Yes, sir.

A No one today has come and said, "Here are so many millions or trillions of cubic feet of gas for sale to you," and we can not answer, I do not believe, your questions specifically until that happens. And then, like anything else, you say to yourself, "Here is a man who wants to sell me something, I want to be sure that he has it before I buy it." Isn't that right?

Q That is right. But you see, we are trying to take some steps here to see that some of these things that I think you are talking about do not happen, and we have got to find out somehow about them before they happen. It is not much use to us when it has happened, that is our trouble.

CROSS-EXAMINATION OF THE SAME WITNESS BY MR. S.B. SMITH:

Q Mr. Bell, your company is, I take it, quite impartial between the applicants before this Board for a permit to export gas

to the Pacific Coast?

A That is correct.

Q And your company has been in that end of the gas business, I think you said, for 90 years?

A Yes.

Q You have a great accumulation of experience behind you?

A We feel that we have, sir.

Q And your company has, I understand, made estimates of the market in Portland for the consumption of natural gas?

A That is correct.

Q Particulars of those are to be given by Mr. Cook, of your company, I believe?

A Yes, sir.

Q He is more familiar, I take it, than you?

A Yes, sir.

Q However, you, with your accumulated experience, consider your company and its officials to be in a very advantageous position, I take it, so far as estimating the market for natural gas in Portland?

A Yes, sir, we believe that we are.

Q In as favourable a position, if not a more favourable position than anyone else?

A Well, I would say that we have confidence in our estimates.

Q And you have given estimates prepared, I take it, some months ago?

A Yes.

Q And were those estimates furnished to the Westcoast Transmission Company?

A To the best of my knowledge, identical information was

furnished to all interested parties who asked for it.

Q Thank you.

CROSS-EXAMINATION OF THE SAME WITNESS BY MR. C.E. SMITH:

Q Did you furnish any information to Mr. Smith's client, Mr. Bell?

A I believe that that was done.

Q The same information ?

A I did not furnish it personally.

Q But you think that was done?

A I think it was done, or if he would ask for it he could have it if he has not it already.

Q In other words, you are neutral as far as the man's name is Smith, Jones or Robertson?

A Yes.

Q After Mr. Fenerty's examination of you, I take it your position is still what you stated before, namely, that you would have to be certain that there were adequate reserves?

A Yes, sir.

Q I mean, there is no change in that statement since your examination here?

A No change at all.

Q You also told him with respect to the adequacy of reserves for your purpose, you said that that would be determined in part by this Board. You remember, in part?

A Yes.

Q And you know that this Board sits on this application - - were you here when I asked a few questions of Mr. Mainwaring?

A I was.

Q You know this Board sits under the Preservation of Resources Act of this Province? You have read the Act, have you?

A I have not read the complete Act, no, sir.

Q I think you should get a copy of it before you leave, because, having regard to your market that your question of adequacy of reserves might in part be determined by this Board. I think you should read it carefully.

Q May I suggest this to you, but you know something about - -

A Yes.

Q That under this Act one of the primary duties of this Board is the question of protection,of adequacy for the people of this Province now and in the future. You know that?

A Yes, sir.

Q And you also heard me read Section 9 to Mr. Mainwaring yesterday?

A Yes.

Q And do you realize that under that Section if you people in Portland,after export is granted, if it is, were securing gas, that there is power in the responsible people in this Province to shut it off if it is necessary for the protection of the people of this Province? You understand that?

A I understand that.

Q I say, that is a possibility which would entail great financial loss to you and great hardship to your customers if that happened, wouldn't it?

A Yes.

Q So you realize that. Do you think the people you serve and may have to serve in Portland realize that, or has there been any publicity about it, I will put it that way?

A There has been very little publicity. I do not believe there has been any publicity, to my knowledge, on this specific point.

Q Let me illustrate. Sorry, Mr. Bell.

A I might go on to say that it has been our feeling that if this Board, with that responsibility, finally determined that there were adequate reserves for export, some of which might be exported to us, that they would go to some length to assure themselves that those reserves were really adequate before granting a permission upon which we would perhaps go into the business of distributing natural gas.

Q In other words, you feel - -

A I feel confident in the people of Alberta.

Q That is what you may have to be frightened of. In other words, you feel that there should be a moral responsibility written into this Act which would mean if the Board say "yes, you are entitled to export", then they must not exercise the duties and the responsibilities they have under their parts of the Act to protect people here and cause hardship to people down there?

A No, sir. I have no desire to go into the natural gas business in any way whatsoever which would in any way conflict with the laws and regulations of the Province of Alberta.

Q I am not suggesting that, Mr. Bell. I am trying to illustrate a possibility in the future, namely, to put it in a nutshell, that to protect ourselves we may cause a hardship on you and your people. See what I mean?

A Yes, sir.

Q I will go further. Supposing this Board from the evidence, the combined evidence that is presented to us, say, "Oh, well, let's take a chance, probable, possible, potential, interesting suggestions," as some of them were called, "and we will grant export." From that moment on I gather you think there is a sort of moral responsibility to take care of yourpeople as well as our own, and there may be, but is that your position? Once granted a permit here you feel you should get some protection through this Board notwithstanding the language of our Act. Is that a fair way of putting it?

A No, sir, I do not believe that is quite the way to put it.

Q Well then, when you say - -

A I would expect that if we were receiving natural gas from the Province of Alberta that although we were the ultimate distributor of that gas, there will be other parties intervening between us and Alberta, and all we would expect or ask was that if something went wrong with the reserves, something happened, that we would receive fair and equitable treatment by the controlling authorities in Alberta under the rules and laws under which they operate.

Q And you will remember the section I read of the Act, Section 9. That is the law under which they may have to operate?

A Yes.

Q There is no doubt about what it says, is there?

A No.

Q It might operate in such a way as to leave you entirely without gas or so little it would be useless to you. You realize that, do you?

A You made it very clear, sir.

Q That is all.

CROSS-EXAMINATION BY MR. MARTLAND:

Q Mr. Bell, you have told us that the area which your company serves is a rapidly expanding territory?

A That is correct.

Q And I suppose you would anticipate that that expansion will carry on for some considerable number of years?

A That is correct.

Q And consequently you would anticipate that your demands for natural gas would be increasing from year to year for a considerable number of years to come?

A Oh, I think that is true.

Q Thank you.

MR. NOLAN: If that is all, sir, I would call Mr. Cook. While he is being sworn I would have this brief marked as Exhibit 8.

BRIEF PREPARED BY PORTLAND GAS AND COKE COMPANY PUT IN AND MARKED EXHIBIT 8.

WESLEY A. COOK, having been first duly sworn, examined by Mr. Nolan, testified as follows:

Q Mr. Cook, what is your full name?

A Wesley A. Cook.

Q And you are associated with the Portland Gas and Coke Company?

A Yes, sir.

Q In what capacity?

A Assistant to the President.

Q How long have you been associated with that company?

A I have been associated with the Portland Gas and Coke Company or its associate companies, its affiliated companies, in Portland for 10 years, since 1940, and that service has been continuous except for the period I served in the War.

Q Are you trained in some branches of engineering?

A I graduated from the Oregon State College with a B.S. degree in electrical engineering, sir.

Q For the most part of your professional career you have been engaged in what we may call the gas industry?

A Gas and electric.

Q Gas and electric?

A Yes.

Q Now, you were requested, or your company was requested by this applicant company to prepare a brief for this Board?

A That is right.

Q And is Exhibit 8 the result of that effort?

A Yes, sir.

Q Would you be good enough to read it to the Board, Mr. Cook?

A

NATURAL GAS REQUIREMENTS OF
PORTLAND GAS & COKE COMPANY

BUSINESS OF THE COMPANY

Portland Gas & Coke Company, whose principal office is located in the Public Service Building at 920 S.W. 6th Avenue, Portland, Oregon, was incorporated under laws of the State of Oregon on January 10, 1910, for perpetual duration. The company operates in the States of Oregon and Washington and is engaged primarily in the business

of producing, transmitting, distributing, and selling gas and by-products recovered in connection with the manufacture of gas. The company and its predecessors have been in the business of supplying manufactured gas since 1860.

The territory now served by the company, shown on the map included herein as Appendix 1, consists of 440 square miles of area, supplied through 2,465 miles of mains serving 81 communities, including the cities of Portland, Oregon City, Salem, Albany and Corvallis in the Willamette Valley, Oregon, and in Vancouver, Washington.

Basic industries in the territory served include processing of fruit and agricultural products, forest products, paper, abrasives, aluminum reduction and shipping. The population of the area served, according to 1940 census, was approximately 478,000 and is now estimated to be in excess of 700,000.

Q I wonder, Mr. Cook, if you would just draw the attention of the Board and counsel to that map. It is the first Appendix, is it not, to the report?

A That is correct, sir.

Q And it follows page 6 of the actual narrative. And you might just tell me what those black lines are, those very prominent black lines?

A The full heavy black line follows or approaches our mains through which we transmit gas.

Q And as you have explained in your narrative, it includes some quite large cities in addition to the city of Portland itself?

A That is correct, sir.

Q One of them being Salem and another one Albany?

A Correct.

Q They are some distance from Portland itself, are they not?

A Salem is approximately 50 miles, with Albany another 30, Corvallis perhaps about 12.

Q There is a lateral?

A Over to Lebanon, yes, sir.

Q And a lateral to Dallas?

A Correct, sir.

Q And that map has been reproduced for the purpose of showing the extent of your operations and to emphasize the point that it is not metropolitan in character so far as Portland is concerned?

A Yes, sir.

Q Is there anything else you think you should say about this map? It is self-explanatory?

A I believe it is self-explanatory.

Q Well, carry on, Mr. Cook.

A

GAS MANUFACTURING, TRANSMISSION AND DISTRIBUTION FACILITIES

MANUFACTURING

The company manufactures gas and other products from heavy residuum oil obtained in tanker lots from California at its plant located on the west bank of the Willamette River, approximately six miles north of the city center of Portland. Under state regulations, gas distributed by the company must have a monthly average heating value of 570 B.t.u. per cubic foot. The description

and maximum daily capacity of the gas manufacturing equipment are as follows:

Number	Kind	Maximum Daily Capacity-MCF ✱
12	Single Shell Oil Gas Generator Sets (Cross-connected in pairs) 570 BTU	37,000
2	Single Shell Oil Gas Generator Sets - 570 BTU	13,000
4	Knowles Coke Ovens Reformed 570 BTU	4,000
4	Liquefied Petroleum Gas Plants	23,571
	Total -	77,571

✱ 570 BTU Equivalent.

I might make one point there, and it is to call your attention to the capacity of our Liquefied Petroleum Plant. I do that because in all our computations though we show you on Appendix 4 our maximum daily demand, that is, the demand on the company, these demands would be reduced by the amount at the capacity of our Liquefied Plant, the demands they will place on a pipeline company.

Q I take it, Mr. Cook, you are talking about shaving the peak?

A That is correct, sir.

Q And perhaps you would be good enough to explain to me what that means in language that I can understand?

A I will try, sir.

Q That may be difficult.

A As indicated on Appendix 4, and we will just discuss the 5th year, we indicate that on our coldest day we will require approximately 108,027 Mcf.s of gas on that day to properly and adequately serve our customers.

Q That is a peak day?

A Now, what we propose to do is reduce that peak by the capacity of our Liquefied Plant, and for estimating purposes we use 20,000 MCF. as the maximum.

Q Now, that will result to your advantage in shaving that peak?

A That is right, sir.

Q Why will it?

A That will improve the load factor considerably, sir, and load factor is a function undoubtedly, or will be function of our rate.

Q And these liquefied petroleum gas plants are the establishment which perform this function?

A That is correct, sir.

Q But these plants which are described in the first paragraph on page 2 of your brief are at the present moment manufacturing what we call - - is it 570 BTU.s?

A No, sir, that is not true. We produce from our Liquefied Plant gas at a thousand BTU.s per cubic foot.

Q At the present moment?

A At the present moment.

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Q So there is no conversion or changeabout?

A No, sir.

Q I see, thank you. I think we can go on.

Q DR. GOVIER: Excuse me, Mr.Cook, do you mean that you have a dilution plant?

A Pardon, sir?

Q Do you also have a dilution plant in your present system to reduce the BTU content to 570?

A The butane that we put into our system is small compared to the total and the customers presently get the advantage whenever we add the butane by the amount that we increase the BTU gas.

Q MR. NOLAN: You might go on, Mr.Cook.

A Normal operating capacity, allowing for some unit to be out of service during peak periods, is approximately 71,000,000 cubic feet. Maximum daily sendout of the company during the winter of 1949 - 1950 was 68,656,000 cubic feet, which I might say in passing almost proves our estimated capacity.

TRANSMISSION SYSTEM

Gas is pumped from the Company's plant by electric and/or steam driven compressors through two separate major transmission mains to two high-pressure pumping stations, and to three low-pressure holder sites located at strategic points in the city of Portland. The low-pressure area is fed directly from the holders at these sites, and the high-pressure system, in and around Portland and in the Willamette Valley south of Portland, is fed by gas pumped into the high-pressure system by a bank of compressors located in Station "E" at S. E. 11th Avenue and Clinton Streets and Station "F"

at 735 N. W. Miller Road in Portland. The transmission mains which carry the gas from the plant to the three holder sites in Portland and two pumping stations consist of the following sizes and mileages of pipe; and the sizes run from 3" of the minimum to 16" maximum.

Size	Kind	Miles
16"	Cast Iron	6.514
30"	Steel	2.300
24"	Steel	4.471
22"	Steel	2.005
16"	Steel	0.322
12"	Steel	5.640
3"	Steel	0.983
Total		22.235

The gas is pumped from Station "E" and Station "F" to the outlying territory through high-pressure mains, which are also used to supply customers enroute. The quantity and size of these mains, 4" and over are as follows:

Size	Miles
16"	0.342
10"	10.310
8"	40.620
6"	31.057
4"	27.542
Total	109.861

The functions and capacities of the various holders are as follows:

Location	Function	Cu.Ft.Capacity
Production Plant - Portland	Distribution and Relief	1,485,000
N.W.Front and Glisan - Ptld.	Storage	1,500,000
N.Alberta & Kerby - Portland	Storage	1,200,000
S.E.11th & Clinton (stat."E") Portland	Storage	2,031,000
S.E.11th & Clinton (stat."E") Portland	Storage	2,040,000
S.E.11th & Clinton (stat."E") Portland	Storage	2,058,000
133 Court Street - Salem	Storage	100,000
815 Kings Road - Corvallis	Storage	100,000
Total		11,514,000

Q MR. FENERTY: I wonder, just to have it on the record, I think you said a maximum of 16"inches for all sizes, and that was not the maximum, because your maximum was 30 inches, wasn't it, when you were referring to that Table at the top?

A Oh, I beg your pardon, sir. I think I said a maximum of 16, it should be 30 inches. That is right.

DISTRIBUTION SYSTEMS

Standard distribution system designs were established for both low-pressure and high-pressure systems, these designs being based upon complete load saturation in each square mile. In the case of low-pressure distribution, a network of 10"mains was laid out, such mains running in both directions at one-mile intervals. The 10" mains are interconnected at the middle of each one-mile interval by 6" mains running in both directions. The design included 4" mains as standard installation on all intervening streets and this grid is supplemented by adequate additional feeder mains where necessary. In the case of high-pressure distribution, 2" mains were laid out for each square mile,

with 1" mains on other streets, this grid also being supplemented by adequate additional feeder mains wherever necessary.

These distribution grids were constructed piecemeal as the gas load developed in various sections of the service area, but the fundamental design was followed consistently, and the furnishing of capacity to supply load growth in any area has required only the completion of tie lines within the area, or the installation of additional feeder capacity to it.

The quantity and size of distribution mains are as follows. The size range here is a maximum of 32 inches and on down to 1 inch for a total of 233,000.361 miles of distribution mains.

Q MR.NOLAN: A total of what? You said 233,000?

A Excuse me, 2,333.361.

Q Yes.

A

Size	Low Pressure	High Pressure	Total Miles
32"	3.314	-	3.314
30"	0.539	-	0.539
24"	3.722	-	3.722
22"	0.319	-	0.319
20"	0.879	-	0.879
16"	7.059	-	7.059
14"	0.764	0.071	0.835
12"	3.899	2.800	6.699
10"	39.437	8.437	47.874
8"	6.468	10.398	16.866
6"	112.324	66.777	179.101
4"	492.268	100.783	593.051
3"	9.885	22.212	32.097
2"	82.182	337.576	419.758
1½"	0.419	0.931	1.350
1¼"	2.494	14.772	17.266
1"	0.339	1002.293	1002.632
Total	766.311	1567.05	2333.361

FORECAST OF REQUIREMENTS

During the summer of 1948, the company made a survey of its service area to provide data that could be used as a basis for estimating the potential market for the first five years of natural gas operation.

CUSTOMERS

Based on these data, Appendix 2 was prepared showing the estimated number or customers, by the standard classification of accounts, and in addition, the number of domestic and commercial space-heating customers for the first five years of natural gas operation. Included in Appendix 2 are the actual number of customers,by the same classification, for the years 1946, 1947, 1948 and the

9 months ended September 30th, 1949. That is an error that was made in the written text. It should be September 30th, 1949.

Q September 30th, 1949?

A Yes.

Q Just look at that appendix for a moment. It is split up on the same basis as the exhibits that the other companies have adduced here so far as the form is concerned?

A Yes, sir.

Q And is there anything that you would like to draw the attention of the Board to? I see that you estimate for the future with respect to industrial users, and these are the number of customers we are talking about in this Table?

A That is correct, sir.

Q And for the first year it would be 8 and for the fifth year 40 firm, and for the first year 2 and the fifth year 35

interruptible?

A That is correct, sir.

Q Well, then, I think we could go to Appendix 3, couldn't we? The script follows on?

A There is a little written description in the text.

Q Yes, perhaps you might read that?

A SALES

Appendix 3 shows the actual MCF sales of the company of 570 BTU manufactured gas for the years 1946, 1947, 1948 and the 9 months ended September 30th, 1947. Again there is a correction in the text. Using the present customer gas requirements, converted to 1000 BTUs, the estimated natural gas market for the five-year period was obtained for domestic and commercial classification. Existing potential industrial accounts were contacted by the company, and the quantity of oil used annually in their operations was obtained. This quantity of oil was converted on the BTU basis to MCF of natural gas to obtain the estimate of the industrial market.

Company use and unaccounted for gas were estimated by the company based on experience records in its manufactured gas operations. These quantities were totalled, and are shown as the total sendout, or the amount of gas required, under the estimate for the first five years of natural gas operation.

Q Now, looking at Table 3, Mr.Cook, I observe that there is no industrial market up to and including the year 1949?

A That is correct, sir.

Q Either firm or interruptible?

A Yes, sir.

Q Why is that?

A That is purely a matter of economics, sir.

Q It is a matter of price?

A The industrial people cannot afford to pay the prices of manufactured gases, it is too mugh higher than oil.

Q Now, projecting ourselves into the future, from the first, second, third, fourth and fifth year, under this industrial head the firm would come to 1,123,000 MCF?

A That is correct, sir.

Q And the interuptible to 10,550,000 MCF?

A That is right, sir.

Q Is it fair to say that this industrial load is the controlling factor in this estimate?

A It surely is, sir.

Q What is the percentage of those industrial sales as compared to sales of all gas for other purposes?

A About 45%. Approximately 45%.

Q Yes, I see. And again this Table 3 follows the format that we have used in other Tables for other companies?

A That is correct, sir. To date those that have been presented here, the companies represented had retained the services of a professional firm to guide us in preparing these data.

Q Yes, that is clear. Thank you. Perhaps you could go on now?

A <u>PEAK REQUIREMENTS</u>

The estimated maximum day requirements by classification of accounts is shown in Appendix 4.

TThe estimated maximum month by classification of accounts is shown in Appendix 5 as a percentage of annual

requirements and is based on data from the company's operating records.

The estimated maximum hour by classification of accounts is shown in Appendix 5 as a percentage of maximum day and was also based from the company's operating records.

Q Is there anything noteworthy in Appendix 4, Mr. Cook?

A I think nothing further than I called your attention to earlier in indicating that we would do peak shaving to the extent of approximately 20,000 MCF on peak days.

Q To reduce that total of 108,027?

A To approximately 88,000 MCF.

Q And then you turn in Appendix 5 to the maximum month and the maximum hour requirements, showing the percentages?

A That is right. And they were taken directly from our operating record.

Q And then the last is Appendix 6, which you might read from the narrative, would you, please?

A Yes, sir.

Q Meteorological data?

A Yes. Appendix 6 contains data taken from official meteorological records of the United States Weather Bureau. January and July average temperature and the maximum and minimum temperature were based on 75 year weather records for the Portland area. Mean degree days by months were taken from weather records for a period of 52 years, 1898 - 1949, inclusive.

Q Now, Mr.Cook, is there anything you would like to add yourself to what you have already told us, or do you think that completes the picture as far as your written report is concerned?

A I believe that sets forth our best estimates. I might make one remark, and that is that in making a market study at the time it was made it was necessary for us to assume that we could purchase natural gas at a price that would permit us to sell that gas in competition with other fuels in the area. Not knowing what it was going to cost, we had to make such an assumption.

Q Yes.

A And we instructed our market people to make their study of the market on that bases, and that is exactly what they did.

Q Now, you were asked to make some computations, Mr. Cook, in respect of the cost to you of gas at 30 cents per MCF, 35 cents per MCF and 40 cents per MCF, and you were asked to say what effect that would have on your estimate which we have just been discussing. Can you tell me what the effect of a net cost of 30 cents per MCF would have on your estimate?

A We feel that with an average price of 30 cents to the company we would be able to meet the market that we have estimated.

Q Yes. Putting it in another way, you would be able to maintain a market of that dimension?

A That is correct, sir.

Q Yes. Then if it were 35 cents?

A At an average price of 35 cents in making the calculations, it is indicated that we would be only able to obtain about 75% of our estimate here.

Q You have given me that figure in percentages?

A Of the total.

Q As a matter of fact, you would be reduced to about 17½ million MCF?

A That is correct, sir.

Q And if it were 40 cents on an average cost to you per MCF, what would the effecT be?

A We feel there that we would be able to retain approximately, or obtain approximately 60% of our estimates.

Q Of your estimate?

A Yes.

Q DR. GOVIER: Mr.Cook, are those percentages of your total load?

A Of the total load, sir. It will be a little clearer,at 35 cents we would be able to market approximately 17½ million, and at.....

Q MR NOLAN: 40 cents?

A 40 cents, I believe it was 13,700,000, something like that, as I recall.

Q DR. GOVIER: What portion of your load which you think you could maintain at 30 cents would you drop if the price were raised to 35 cents?

A It would be the interruptible, sir.

Q The industrial interruptible?

A Yes, the industrial interruptible.

Q Why would you drop that portion of it, Mr.Cook?

A The interruptible is your most competitive market. I mean, it would be the first one that would feel it, it would be the most sensitive.

Q Thank you.

Q MR.NOLAN: The question was put to you as to why you would drop that market. Is it that you would drop

it or there would be no demand?

A We couldn't obtain the market because of the competitive situation.

DR. GOVIER: The question was put poorly. I mean or meant the portion that was unobtainable.

MR.NOLAN: There would be no market for it is what you meant, Dr.Govier?

DR. GOVIER: Yes.

Q MR.NOLAN: Now, did you have any conversation with a representative of the Ford, Bacon & Davis Company about the Portland market?

A I supplied Ford, Bacon & Davis when they called at my office with the identical figures we have been presenting here.

Q In Exhibit Number 8?

A Yes, and in addition I furnished him with quite a volume of weather records, and I believe they photostated a group of them, a group of that material.

Q Did you have any discussion about the price that your company should pay a pipe line for natural gas?

A Yes, sir.

Q What was that discussion?

A It was a very brief discussion. We were talkihg about the competitive situation in the Portland area, and making a very simple calculation he indicated to me that perhaps we would have to be able to obtain gas at about 27 cents, 27½ cents.

Q That was indicated to you?

A Yes.

Q When was that, Mr.Cook?

A It was a good number of months ago, I cannot recall.

Q Was it this year or last year?

A No, sir, it was last year.

Q It was some time in the latter part of 1949?

A That is right.

Q Thank you.

.....

CROSS-EXAMINATION BY MR. FENERTY

Q Mr.Cook, speaking of that interruptible load?

A Yes, sir.

Q As my friend has pointed out, you have made no estimate of any interruptible load during the first five years?

A Yes.

Q Now, in not being able to depend on it, is that due, perhaps, to some extent to the fact that you think you can tare care of some of your peak load through your, what I call, subsidiary operation, your liquefied plant?

A That is of great assistance to us.

Q What is that?

A That is of great assistance to us to be able to take on the load that we do.

Q But even with that supplementary source you would not get a uniform demand for natural gas summer and winter, would you? I mean,you wouldn't have a perfect picture for natural gas with 100% of your load, the same winter and summer?

A No, sir. That is the reason that we need the interruptible, sir.

Q And that being so, you would still be interested in the interruptible load, wouldn't you?

A We must have it, sir, to round out our operations.

Q And my understanding is that it is not only good pipeline practice, but distribution practice, to canvass for interruptible load in order to take care of that difference?

A That is correct, sir.

Q And you would anticipate that over the course of years you would have some success in obtaining the interruptible load?

A It is almost a requirement.

Q What is that?

A It is just a requirement, sir, we must do it.

Q You must do it?

A That is right, sir.

Q And then you will necessarily have some amounts in excess of what you have estimated here, by adding figures where this column of noughts occurs for interruptible load?

A Where is that?

Q I have here your estimated future requirements for the first, second, third, fourth and fifth years, Appendix 4?

A Yes, sir.

Q And I do not see anything for interruptible load?

A That is right, sir.

Q But you say you must get that load?

A We do get the load, but it does not add to our maximum day, because they are off on the maximum day. We do not serve them on the maximum day, so that causes no demand on our system.

Q But wouldn't that affect your total if you get that load?

A No, sir. This is the peak.

Q Oh, this is your peak?

A Yes.

Q Pardon me. That is your maximum demand?

A Yes.

Q I am sorry. Where is your volume demand? I was looking at the wrong column?

A Appendix 3, sir.

Q I was looking at the wrong column, I am sorry.

A Yes.

(Go to page 354)

Q You have your interruptible there?

A Yes, sir.

Q I am sorry. I did not understand. I take it you would have to count upon a minimum of 20 years' supply of natural gas before you would be interested?

A Anything I say will be my own personal opinion in this matter. Mr. Bell would have to speak for the company, sir. He is present. But in my own personal opinion I would say yes.

Q I think as a matter of fact that as far as export pipe lines are concerned they are counting on at least 20 years. Now I note in your submission, and not only yours but that of other people, that they stop at the end of the 5th year?

A That is correct, sir.

Q I would be very much interested in your estimate of the requirements for 20 years, say, as a minimum, rather than five years. I suppose you anticipate a continued advance in the use of natural gas by you?

A If it is available, sir, in quantity on a competitive basis we could anticipate a general increase.

Q Now I would like to know something about the saturation in Portland as compared with the saturation here. Your figure here is - -

A Are you referring specifically to the industrial load?

Q Yes.

A First?

Q Yes.

A We anticipate that we will displace all heavy oils. We will displace no solid fuels of any kind. There is not a great deal of that used in Portland.

Q Could you give us something in percentages?

A This is a very heavy saturation of the industrial market.

Q What about the domestic market and the commercial market?

A No, that would be light. What percentage that might be I do not know. We have a great use of electrical energy in our area that would undoubtedly still be maintained.

Q I know that the problems down there are not the same as ours. We have electrical energy but not in the same relation to natural gas. It would be light?

A Yes.

Q But you do anticipate that there will be a substantial increase from year to year?

A The gas being available, I am sure of it.

Q We have heard from some of the others that people will use natural gas in place of electrical energy. Do you think that is visionary or do you think that is so?

A It is a possibility.

Q If that is so you would have a heavy potential field in the domestic market, at least, for gas?

A No, sir, only in the form of space heating. As to hot water heating and cooking, we will not be able to disturb the present market in the areas we service.

Q But having in mind the advantages of Alberta natural gas being more widely known and increases in the population in the Portland area over the years - -

A Yes.

Q - - would you expect, perhaps, a 10 per cent increase each year throughout the next 20 years?

A Are you assuming that gas can be made available?

Q Yes?

A Yes, we would anticipate a normal growth as you would expect in any operation. You do not necessarily stand still.

Q Have you made any estimate of that?

A No.

Q Do you think that an average of 10 per cent might be reasonable?

A I do not know.

Q If you could do it for 5 years, could you not do it for 20?

A I could.

Q Then why cannot you give me an idea of what it would be in 20 years?

A I have not made any study of that and I would not like to give evidence from the witness box without having made such a study.

Q Can you give me any idea why you stopped at 5 years?

A We only made a study to the end of the 5th year of operation.

Q Was that by reason of a request?

A Yes. I was asked to make a study for a 5-year period and I followed my orders.

Q You have no knowledge of why you were requested to stop at the 5th year?

A No.

Q We will have to presume that.

CROSS-EXAMINATION OF THE SAME WITNESS BY MR. BRUCE SMITH.

Q I think you said to Mr. Nolan something to the effect that the load factor was of great importance in the transmission of natural gas. That is so?

A That is right.

Q The higher your load factor the more efficiently your pipe

line is being used?

A Yes, sir.

Q Or your distributing system, and the more efficiently that is being used the cheaper the cost of distributing the gas therein?

A That would follow, yes, sir.

Q In your own distribution system I think you mentioned that - or I am not sure whether you said you have or not - that the industrial load is a matter of considerable importance. In fact, it is one of the items of greatest importance in your situation, is it not?

A It is important.

Q And then the combined firm and interruptible commercial load. The interruptible is a matter of very considerable importance because that interruptible load increases your load factor, does it not?

A That is correct.

Q Your industrial interruptible market in your 5th year is 10,550,000. Now, having listened here during the last two days, you have heard that Messrs. Ford, Bacon & Davis have increased the British Columbia Electric estimate of markets for Vancouver and varied it considerably, and decreased the estimate of the Seattle Gas Company. I would like to make some comparisons with you as to what Messrs. Ford, Bacon & Davis show in relation to your figures. With regard to this industrial load the firm figures given by you first is 1,123,000?

A Yes.

Q And you know that Ford, Bacon & Davis' figures are 5,546,000. That is a substantial increase, is it not?

A Yes.

Q A great variation from your figures?

A Yes, sir.

Q Which they have had since last year sometime?

A Yes, sir.

Q And when you come to interruptible, the interruptible is a factor of the very greatest importance, is it not?

A To us, yes, sir.

Q Yes, to you. The interruptible industrial load at the end of the 5th year, your estimate is 10,550,000 and they decrease it to 4,000,000. That again is a very substantial change, is it not?

A Yes, sir.

Q They take your firm industrial away 1 billion and something down to 5,546,000 and they take your interruptible from 10,550,000 down to 4,000,000. The tendency of that would be to decrease the load factor substantially in your distribution system?

A Definitely.

Q And decrease the load factor in the pipe line that carries the gas to your system also?

A Yes, sir.

Q And when we come to domestic non-space heating of 2,537,000 they decrease that to 1,094,600. That is a pretty big drop in domestic non-space heating?

A Yes, sir.

Q And commercial non-space heating you give as 1,014,000 and they increase that to 1,341,167. Your domestic space heating, 6,098,000 and they increased that to 6,952,400. Commercial space heating you give 1,154,000 and they

decreased that to 1,341, 166. There are some tremendous changes?

A Yes. I am assuming the figures you are reading are correct. I do not have the report in front of me.

Q You have all these gentlemen in front of you checking me and you can assume unless they interrupt that they are correct?

A There are definite changes in the estimates.

Q And the figure you give for give for company use is 15,000, and unaccounted for, 700,000. Whereas they use an item "unaccounted for" and they increase your two items to 1,520,650. There is certainly a wide difference of opinion between you people who have been in the gas business in Portland for 90 years and the gentlemen who prepared the figures in that report. There is no doubt about that?

A I think one item there can be explained and that is the unaccounted for. They do not know how much we are going to spend in the future and we do. Now I would like to call attention to the fact that we interviewed all of our customers personally. We went over their books. They were open to me.

Q You mentioned to Mr. Nolan that the representative of Ford, Bacon & Davis was in Portland and interviewed you and that you made all your information available to him with regard to the meteorological factor and everything else?

A Yes, sir.

Q Was he there some time or just on a short visit?

A I have no idea how long he was in Portland. He was in to see me just on one occasion.

Q And how long did that interview last?

A I suppose we talked for about four hours. I must amend that. He did drop in when he returned the records which I had loaned to him.

Q Would it be possible for you to recount the hours you spent in preparing Exhibit No. 8?

A The hours I spent are very small when compared to the total. I am only one individual. You must remember there were very many more working on this study.

Q You have a large staff under your direction?

A That is right.

Q There would be hundreds of hours spent in the preparation of it altogether?

A Yes, sir.

CROSS-EXAMINATION BY MR. D. P. McDONALD.

Q Mr. Cook, can you tell me a few things about your company? What is your present load factor with your present 570 BTU gas operation? Have you got that in mind?

A No, sir, I do not have that right in mind. I might suggest to you that that could be obtained by somebody if we had a slide rule.

MR. C. E. SMITH: Surely we have lots of those.

A You could compute it from last year. We had 6800 and we might probably sell 9 million over the year.

Q 9 billion over the year?

A Yes.

Q MR. McDONALD: Then you might be able to tell us, because the calculation there was made fairly recently, the working of this 30, 35 and 40 cent calculation that you refer to? You then figured out your load factor that

you have estimated for your 5th year of natural gas. Seattle was 10 per cent and I was wondering what yours was?

A Based on the market estimate?

Q Based on the market estimate in the 5th year?.

A I think it will be something below 60 per cent somewhere. If you deduct the 20,000 which we propose to use on peak shaving it will give you up to better than 70 per cent.

Q With peak shaving I think it comes to 72 per cent and without peak shaving 59 per cent?

A That is close to 60 and close to 70.

Q Yes. Now Mr. Sample has calculated your operation last year was 36 per cent and I was wondering do you agree that is about right?

A Yes, sir.

Q I just wonder did you make the statement that industrial gas is a controlling factor in your operation? Just what did you mean by that? I think that was the words you used?

A I think you will find it is 85 per cent of our estimate and that would be a very large volume and quite important in a marketing company.

Q You have been in business for 90 years?

A Yes.

Q You have had no industrial load at all up to date?

A That is correct, sir.

Q And you are not going to go out of business even if all the gas you obtained is equal to your present load of domestic and commercial?

A We propose to stay in business a little longer.

Q On your figures you say that at 30 cents price you would figure on, say, 23 billion cubic feet?

A Let us not say 30 cents exactly, but approximately 30.

Q In the neighbourhood of 30 cents and in the neighbourhood of 35 cents you would lose 25 per cent so you would bring it down to 17 billion?

A That is correct.

Q And when you come to 40 cents price you still think you could use roughly 13.7 billion?

A Yes.

Q That is a substantial purchase?

A May I just make one qualification. Those are based on competitive prices at that time.

Q Based on competitive prices of competitive fuels?

A Competitive fuels.

Q In your case you have stated that you are in competition with oil and that is your main competitor?

A Yes.

Q I am thinking now of industrial?

A Yes, sir.

Q Am I right in reading your submission to say that your total for firm and interruptible in your 5th year, that your total is 11,673,000,000, is 100 per cent saturation of the oil, the heavy fuel oil market?

A No, I did not say 100 per cent saturation but it is close to it.

Q 95 or 96?

A Close to it.

Q So that you are anticipating that your gas would be sold to you on a basis, as I take it, of BTU value as between oil and gas that you could stand before your customer and

say: "Here is your bargain, you take it."?

A Roughly, that is correct.

Q So that someone else making an estimate of the same market would say, "well, that is rather a sanguine estimate, when you are counting on getting 95 to 96 per cent, when you consider they are on an interruptible basis, and then all the inconvenience - -"

A I do not believe it is so inconvenient. We are not requiring the customer to make any additional investment installing oil tanks and burners and whatnot. The only addition to our capital is to buy the gas and use it. The oil is surely displaced.

Q If that is so, why didn't you keep your oil business on a firm basis rather than on an interruptible basis? You want your interruptible in order to take care of your domestic market?

A That is a very simple answer, yes.

MR. C. E. SMITH: You do not mean the oil business. You said "why don't you keep your oil business" - -

MR. McDONALD: I mean displace oil with gas. Mr. Cook understood me.

A Yes, displace oil with gas.

Q The more interruptible industrial load you have, should not you be able to handle more domestic space heating?

A If the space heating load is limited by the amount of the interruptible load you are able to obtain and maintain a higher load factor. We propose to do that. We do presently.

Q Now this estimate that was made was, or the initial work on the preparation of this estimate as I understand was done in the summer of 1948?

A That is correct, sir.

Q Can you tell me the basic fuel oil price, Bunker C fuel price at that time?

A It was better than $2.00. Just where it was in that range I do not know.

Q Yes, better than $2.00?

A Yes.

Q If the price of oil should move 1 cent a gallon or 42 cents a barrel, what does that mean in the competitive price of gas on a BTU basis?

A A 1 cent change in oil?

Q No, 42 cents. If there was a 42 cent increase in the price of oil, the competitive price of gas could be increased by how much?

A If you make the division you will have the answer.

Q 7 cents?

A Yes.

MR. C. E. SMITH: Get your rule.

Q MR. McDONALD: If the price of fuel oil is $1.50 now, and the price went to the 1948 $2.00 - as I understand it was $2.45 a barrel, do you agree with that?

A I answered it was above $2.00 somewhere.

Q Well, we will take $2.00.

A I know it did reach a point of $2.45. I know I heard of that at one point, but I do not just remember what it was when we made the study.

Q Your price of 30 cents as your average, and you could still do your business if your average price of 30 cents would be increased to say 40 cents, if the price of oil went up to $2.00. Assuming your 30 cent price was worked

out on a competitive fuel oil basis. The information given to us is that with $2.00 you could purchase gas from the pipe line at 40 cents?

A It goes up on a ratio.

Q It depends on whether the price of fuel oil is going to go up or down or going to remain where it is?

A That is right. But we made this market study without any thought of the price of fuel oil. The price did not enter into it a good deal because I just told our people we are going to be competitive and that is all that is necessary. Because we do not know what the price of oil is going to be, when we are talking about these market surveys.

Q What is the effect on the 35 cent price? What are the data that you arrived at on that, taking into account the price being $1.50 or some relative price?

A I would not say $1.50. We got the actual price the people were paying and that is a better measure, the cost of the oil to them. It was a personal contact.

Q And if the price of oil goes up then the price of the gas could go up from 30 cents?

A I would be able to increase the price of gas correspondingly.

Q When you come to sell your industrial, interruptible and firm gas, your talking point is going to be whether the customer should have a firm contract with you, based on your 20 year supply of gas, or whether he should gamble on the price of oil in the market?

A I do not know that it is such a gamble. We have done very well and we buy a lot of oil.

Q It is a gamble because you do not suggest to me that the price of oil is going to be fixed for 20 years?

A No, we certainly do not. But in order to be fair to our gas customers there is no reason why it should not go down as well as up. They should not be left out on a limb that way either.

Q Now can you tell me in the working out of your figures here what was the percentage of your total revenue that would be obtained from your domestic sales? Can you tell me whether it is 50 per cent?

A No, sir, I cannot even answer any questions on revenue because I do not know. There again we are displacing markets. We assume we would be able to sell in competition and what can we get from the market, based on the classifications in the area?

Q You have three classifications of sales. You have roughly three classifications of rates?

A Yes, sir.

Q You have domestic general use and space heating. Commercial general use and space heating and industrial firm and interruptible?

A That is correct.

Q And in working out your 30, 35 and 40 cents in the submission you have made today can you tell me whether your domestic sales are going to aggregate in the gross 50 per cent of your total revenue?

A No. Our losses were assumed to be on the industrial only.

Q I am just trying to find out, Mr. Cook, and I wish you would help me if you could, what is the effect of this drop in the industrial rate on your gross revenue, which, after all, is of importance?

A It has more effect on what our cost of gas is going to be than what our revenues are going to be. They are not going

to charge me for a poor load factor and penalize me for it.

Q You are anticipating a demand and commodity purchase contract?

A Surely.

Q And in making up this average rate of 30 cents on your purchase side, what did you have in mind as your lowest industrial price?

A How do you mean?

Q I mean in calculating your ability to pay an average price of 30 cents you calculated your income at a domestic price so much, and a commercial price so much?

A No, sir. There again it resolved itself entirely and my reply was completely based on the industrial load.

Q In order to arrive at the proportions?

A Ordinarily the proportions -- I did not lose any. I did not indicate that we lost any of our artificial or commercial business whatever.

Q I agree with you. Well, tell me this, what is the difference between your industrial price at 30 cents and the industrial price at 35 cents which caused you to lose 25 per cent of your gross?

A Just the difference in price. You are no longer competitive.

Q Say you are selling to an industrial customer at 32 cents and you put your rate up to 37 cents, is that what would cause you your loss of 25 per cent of your load?

A Naturally, you get to the point where you cannot compete with oil and the minute you do that you lose business. You cannot retain it.

Q I am just trying to work out, Mr. Cook, what this average rate means. As I take it, this 30 cents that we are talking about is the 30 cents for the 23 billion Mcf.?

A As an average price at a stated load factor.

Q At a stated load factor?

A Yes, sir. We assumed 70%.

Q 70% load factor?

A That is correct, sir.

Q Now then, if there is an increase in the price of 35 cents without a corresponding increase which you can charge to your industrial customer, then you say you lose this proportion?

A If you add that price to the industrial load based on to-day's cost of fuel to that consumer, you would lose it, you would no longer be competitive.

Q Well now, if you lost - - wouldn't you have an alternative, if the price went to 35 cents,instead of charging it to your industrial you could charge it to your domestic or commercial section without penalizing him unduly?

A I am afraid that our Utilities Commission would not permit such a thing, they would insist that our class service maintain itself. In other words, they are not going to allow that residential customers subsidize our industrial business.

Q You understand each branch of your sales - -

A That is right.

Q Will establish its own load factor individually?

A To some extent, yes. In general, I mean, that would have to be an average of your whole grouping or class of customer.

Q I am sorry to delay you, Mr. Cook, but as I take it, in

arriving at this average you are thinking of a demand on commodity contract with the transmission company?

A We had to assume something, yes, sir.

Q And you assumed that the commodity rate would be what, less than the average of 30 cents?

A Yes, sir.

Q Now then, if you could sell gas to industry, could you not at less than the average of 30 cents?

A Today I would have to be a good deal below 30 cents in Portland with my heavy industrial load competing with Bunker C, I would say approximately 20 cents to compete.

Q Approximately 20 cents?

A Yes, sir.

MR. NOLAN: If no other counsel are asking questions, there are just two short questions I would put to this witness.

MR. FENERTY: Two more questions I would like to ask. Perhaps you would want to deal with them after I ask them.

MR. C.E. SMITH: It is 5 past 11:00. I know you are only going to be a moment, or intend to be.

THE CHAIRMAN: I think we will see if we can clean up with this witness.

CROSS-EXAMINATION BY MR. FENERTY:

Q I think I will be less than a minute, Mr. Cook. Just about that interruptible load, as I understand it, the larger interruptible load you can obtain the more gas you will use and consequently the cheaper your average price of gas will be.

That is right, isn't it? I have heard evidence here that the price to the distributor is going to be on a sliding scale. Do you understand it that way?

A THE WITNESS: No, sir, not quite. You would not say a sliding scale. In other words, assuming that we have a 70% load factor, and the average price at 70% load factor is 30 cents, all you have to do is take 30 cents and multiply it times the volume of gas we propose to sell and that would be the money we would pay the pipeline, which would be an average price of 30 cents.

Q Isn't that a fact, if you use a million cubic feet more in one year than in another that your average price that you pay to the pipeline will be less?

A At the same load factor. Let us assume the same load factor. The price per MCF. would be exactly the same, as I understand the rate to be.

Q It is going to be based not on quantities but on load factors?

A Load factor will be the controlling thing, yes, sir. I am assuming this now, I do not know.

Q Is that load factor of the pipeline?

A No, our load that we take from them. I am assuming this because no one has furnished us with a contract. I am just looking at what has been done with other companies.

Q Perhaps you had better leave it until after the adjournment, that one minute is off.

MR. C.E. SMITH: I am a good guesser.

THE CHAIRMAN: I think we had better adjourn now then.

(The Hearing then took a short recess.)

Discussion.
W. A. Cook,
Cr. Ex. by Mr. Fenerty.

THE CHAIRMAN: Would you care to say something about Monday now, Mr. Nolan?

MR. NOLAN: Yes. I will say this, sir, that it is quite obvious to us now that the progress that we have made and by reason of the additional evidence that we have to make, this survey of the Yellowhead route, that we will not conclude or be able to close our case on Friday of next week and we will have to ask the Board to give us the indulgence of an adjournment until some time later. That being so, and having regard to the additional fact that many of those who are interested and concerned in this application have made personal arrangements, it seems to us that the better course to follow would be to adjourn on Monday next, and I would ask the Board to treat it as a holiday so far as my application is concerned.

THE CHAIRMAN: Then tomorrow we will adjourn until Tuesday morning.

Q MR. FENERTY: I think I am back to that one minute. We have had a talk in the interval. I now understand, Mr. Cook, that you anticipate that the rate you pay for gas that you purchase from the pipeline will be based on your own load factor?

A THE WITNESS: Yes, sir.

Q And my understanding is, and I want to see if yours is the same as mine, that if the pipeline company can sell gas to the distributing company which is successful in obtaining a high load factor by reason of interruptible supply particularly in various communities, that could theoretically at least build the pipe company's supply up to something

close to 100% of pipeline capacity.

A It would improve the load factor of part of the distributing company, correspondingly improve the load factor of the pipeline company.

Q You may have load factor of 70% or 80% of the distributing company's and that could result in 100% load factor for the pipeline company?

A Possibly, if there is enough diversity.

Q If enough was, say, interruptible. That is one thing I want to get at.

Q MR. NOLAN: I was just going to ask two questions, if I may, please. You were saying something to one of the counsel, I think Mr. McDonald, about the interruptible load?

A Yes, sir.

Q Now, as I understand it, and please correct me, so far as that interruptible load is concerned, no irreparable damage is done to those customers by the interruption?

A No, sir.

Q Because there is a standby emergency equipment in place?

A Yes, sir. In our case it would be oil standby equipment that they presently have.

Q The only other thing I was going to ask is this, is the price of fuel oil going up to $2.00, Mr. Cook?

A I do not know, sir.

Q Once upon a time a witness in your country was asked what was going to happen to the price of fuel oil and he said, "It is going to fluctuate." Do you agree with that witness?

A Yes, sir, it always has.

CROSS-EXAMINATION BY MR. C.E. SMITH:

Q Might I ask one question, sir. What is the price to the domestic consumer in Portland City of manufactured gas now?

A That would depend on the type of use, sir. Our average price for our heating gas in Portland is somewhere in the neighbourhodd of 65 or 66 cents for 570 BTU. gas.

Q And does that apply to commercial too?

A For commercial heating on some schedules a little higher, sir.

Q Are these prices fixed by Utilities Board?

A A Utitilies Commission. We are under full regulation, sir.

Q And both prices are fixed, are they not?

A Yes.

CROSS-EXAMINATION BY MR. MARTLAND:

Q How would that price work out for the gas with the greater heating capacity? I think you said 65 or 66 cents with 570 BTU. gas. What would be the equivalent?

A Multiply that by about 1.75 and it will give you it approximately.

Q That will give you your result?

A Yes.

Q Can you tell us what you intend selling the natural gas for to domestic consumers, if you have to pay a price of 30 cents?

A Sir, we have not made that study, and further, we would have to go before our Commission before it could be realized.

Q But as I understand you, you said you would have to sell to the industrial users at 20 cents in order to be competitive with oil?

A To your interruptible account, which is a very large account.

Q That is to the interruptible?

A That is right.

Q And have you any idea as to the rate to the firm consumer, firm industrial consumer?

A It would depend upon price. It would probably be in the neighbourhood of 10, maybe 12 cents, above our average price.

Q Thank you.

Q THE CHAIRMAN: Mr. Cook, you told us with the 35 cent price that you would lose 25% of your total requirements of 23 million?

A Yes, sir.

Q Is that based on the 70% load factor? In other words, if you lose 25% of your requirement, which is mostly industrial, wouldn't that mean that your load factor would be decreased and you would automatically have to pay more than a 35 cent average?

A That is true.

Q Well then, at what point then does that affect your commercial and domestic?

A For purposes of this particular question of price, we assumed that there would still be sufficient margin to sell our gas to the commercial and residential or the domestic accounts, sir.

Q Well, at the 40 cent rate average, is that still based on 70% load factor when you gave this estimate of retaining 60%?

A We would not have a 30% load factor if the price goes to 40 cents. It would be further reduced and we would probably end up with an average load factor of perhaps, oh, somewhere

between 55% and 60% load factor perhaps.

Q You took that into consideration when you said you would still retain 60% of your market?

A Yes, sir.

MR. NOLAN: If that is all, Mr. Chairman, the witness may be excused. I would like to call Mr. Woodworth, please, and for your information, sir, he will speak on behalf of the Spokane Gas and Fuel Company, if you have that brief before you, and I intend to follow the same procedure as to these other companies, and that is to produce a high official who will speak as to matters of policy,to be followed by another witness who will introduce the written evidence.

MR. FENERTY: Before my friend proceeds with the examination of this witness, I have a request to make to the Board which I think will assist me and perhaps some other counsel in their future cross-examinations. Perhaps the material is available to me and I do not have it, but I would like to ask for information as to the limitations both as to time and quantities in the present application to the Board. In other words, whether it is limited as to a period or limited as to quantity, or whether it is a wide open application unlimited as to both.

MR. NOLAN: The application itself sets it out.

MR. FENERTY: I have not this in front of me. Is it set out, the limitation? My understanding of the practice of the States before the Federal Power Commission is to apply for a definite period, then, like Oliver Twist, come back and ask for more.

Discussion.

MR. NOLAN: The original application has a 30-year period in it.

THE CHAIRMAN: That stated quantity of gas built up in 5 years and carry on from that 5 years to the 30-year period, which would give you a total maximum requirement in 30 years.

MR. FENERTY: Based on the maximum requirement for 30 years?

THE CHAIRMAN: Yes.

MR. NOLAN: There may be an amendment in that to reduce the period of the permit to 25 years, but that has not been done yet and I am not in a position to speak to that at the moment.

MR. FENERTY: But the authorization sought for is to export than quantity of gas even though it may be double what we have been discussing here?

THE CHAIRMAN: No. I think the application sets out, and each application, as I recall it, Mr. Fenerty, the amount of gas that they would require over that period, with that limitation set on the annual requirement, but there is a total fixed at the present time that we are dealing with.

MR. FENERTY: Then there is a limit as to quantity?

THE CHAIRMAN: Yes.

MR. FENERTY: Thank you.

F. A. Woodworth,
Dir. Ex. by Mr. Nolan.

FRANK A. WOODWORTH, having been first duly sworn, examined by Mr. Nolan, testified as follows:

Q Mr. Woodworth, you are associated with the Spokane Gas & Fuel Company?

A That is correct, sir.

Q What capacity?

A President and General Manager.

Q How long have you occupied the post of President and General Manager?

A About 13 years.

Q And have you spent a considerable portion of your professional life in the gas industry and the electrical industry?

A Practically all of it.

Q And you are trained as an engineer?

A Not as a college graduate but as practical training extending over some 40 years.

Q And would you just in a word, I know there is something contained in the written brief about it, tell me what is the nature of the operation of the Spokane Gas & Fuel Company?

A The Spokane Gas & Fuel Company was incorporated, I believe, in 1887. It has from time to time operated in different methods of gas production, starting out as a coal gas plant, I believe, originally, and operated up until 1948, of March, as a combination coal and water gas plant, and since that time as a butane-air plant. We are serving the City of Spokane only, the corporate city limits.

Q And where do you get your oil?

A We get it from Montana, the butane from Montana.

Q By train?

A By train.

Q From the Montana Field. Now, Mr. Woodworth, you were asked if you would come before the Board and state the policy of your company with respect to the importation of natural gas from the Province of Alberta into the State of Washington. Would you be good enough to state that policy?

A Well, for many years the Spokane Gas & Fuel Company has been under the pressure of increasing costs of raw materials and labour to the extent that the manufactured gas business has suffered greatly, and we have looked forward with considerable hope to the day when we would get relief in the form of natural gas from some area. If natural gas should come from Alberta we should expect to receive it at a price at which we could adequately serve our customers in the face of the price of competitive fuels. We would expect a reasonable assurance of supply, and we would expect to develop these markets to the utmost, both industrial and domestic. I believe that would be our policy.

Q Yes. In other words, you would want an adequate supply?

A Yes, a reasonably adequate supply.

Q You would want some guarantee of continuous operation?

A That is right.

Q And you would want a price that would enable you to compete with competitive fuels?

A Yes, sir.

Q And if those conditions were satisfied the policy of your company would be to look with favour upon the importation of natural gas from Canada?

F. A. Woodworth,
Dir. Ex. by Mr. Nolan.
Cr. Ex. by Mr. S.B. Smith.
Cr. Ex. by Mr. C.E. Smith.

A Very much so, sir.

Q Thank you.

CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Mr. Woodworth, I take it that your company does not support or lend any preference to any particular applicant before this Board for an export permit?

A No, sir.

Q Thank you.

Q MR. NOLAN: Now, if that is all, I would go ahead at once with the other witness, and you may tell the Board who will be called.

A Mr. Hoke will furnish the technical data. He has prepared that in cooperation with our engineers and sales representatives and that will be submitted. He is the secretary of the company.

CROSS-EXAMINATION BY MR. C.E. SMITH:

Q May I ask one question. Mr. Woodworth, you use the expression you would want a guarantee of continuous operation. By that I take it you mean a guarantee for some number of years?

A Yes, a reasonable guarantee.

Q Well, you want to add "reasonable" in front of "guarantee"?

A I said that originally.

Q You said reasonable assurance of supply, Mr. Nolan said "guarantee of continuous operation", and you said "yes".

A We will use the words "reasonable guarantee of continuous operation".

Q Have you sat here when I asked some questions of Mr. Mainwaring?

A Yes.

Q And Mr. Bell, was it?

A I am familiar with that.

Q And you know what I have in mind?

A Yes.

Q And you heard their replies to the questions I asked them?

A Yes.

Q And when you say you want a reasonable guarantee of continuous operation, you have in mind the Act I have referred to and the section I read to Mr. Mainwaring?

A I do.

Q And you realize that under that Act that whatever somebody else may give you the people responsible here may not be able to give you any guarantee of continuous operation?

A I realize that is one of the accepted hazards of the natural gas business.

Q No, it is a lot more than that. Have you read the Act I refer to?

A No, but I am basing it - - I am familiar with the Act as you have set it forth here, yes. I have never read the Act.

Q I mean, that is a little bit different from what you call the "ordinary natural gas operation", isn't it?

A Well, on the assumption that all of the gas might have come from one source.

Q What I am getting at is, to protect us here it may harm you people down there. That is simple language.

A I appreciate that part of it, yes.

Q There is no doubt about that?

A There is no doubt about that.

Ben H. Hoke,
Dir. Ex. by Mr. Nolan.

MR. NOLAN: Mr. Hoke, would you come forward, please. May I have a number for this exhibit, the submission of the Spokane Gas & Fuel Company.

BRIEF PREPARED BY SPOKANE GAS & FUEL COMPANY PUT IN AND MARKED EXHIBIT 9.

BEN H. HOKE, having been first duly sworn, examined by Mr. Nolan, testified as follows:

Q Mr. Hoke, how do you spell your name, H-o-k-e?

A That is correct.

Q And what is your position with the Spokane Gas & Fuel Company?

A I am Secretary and Treasurer of that company.

Q And you were requested to prepare - - well, I should ask you perhaps something of your own experience. How long have you been with this company?

A Since 1921. I attended the Washington State College and served a short time in the Army in World War I, was with an insurance company for about two years, then became affiliated with the Spokane Gas & Fuel Company. In 1921 I became secretary, in 1930, and assumed the additional office of treasurer in 1939.

Q Almost all of your professional career has been spent in the service of this company?

A That is correct.

Q And you were requested to prepare a submission for the information of our Board here?

A I was.

Q And the result of that request is Exhibit 9?

A That is right.

Q That is the brief of the Spokane Gas & Fuel Company?

A Yes, sir.

Q Which you prepared, Mr. Hoke?

A Yes, sir.

Q Would you be good enough to read it to the Board.

A

INTRODUCTION

Spokane is the nearest large American city to the gas fields in Alberta which would offer a good market for natural gas over a long period of years.

The purpose of this brief is to estimate the market for natural gas in the City of Spokane, Washington.

It attempts to cover the following:

1. A brief discussion of the City relating to its location, population, housing and business.

2. A brief discussion of the competitive fuels.

3. An outline of the equipment and past operation of the Spokane Gas & Fuel Company.

4. An estimate of the markets for natural gas during each of the first five years of distribution.

Q MR. C.E. SMITH: "Description"is to replace"discussion" in the text, is it? "A brief description" you said. You understand what I mean, Mr. Hoke?

A No.

Q In the text supplied to us the language is, "A brief discussion".

A That is correct.

Q Just changing the wording?

A I mis-read it, apparently.

Q I did not want to complicate things. Do we change the word or not?

A No. I mis-read it.

SPOKANE, WASHINGTON.

LOCATION AND DESCRIPTION.

Spokane is situated on the Spokane River, a tributory to the Columbia. It is approximately 100 miles south of the Canadian border and 20 miles west of the Idaho State line. It covers an area of 41.37 square miles and the average altitude is 1898 feet above sea level. It is served by 5 transcontinental railroads including the Canadian Pacific Railway Company (through the Spokane International Railway Company). The population is housed largely in single unit dwellings and in common with the newer western cities there are no areas which could be classified as "slum districts".

POPULATION

The population of the City of Spokane has shown a steady and substantial growth as evidenced by the following table covering the past 30 years.

Year	Population	Source
1920	104,437	U.S. Census.
1930	115,514	U.S. Census
1940	122,001	U.S. Census
1949	169,574	Estimated by U.S. Post Office.

HOUSING

The Spokane Realty Board reports that there are 54,332 dwelling units in the City. A survey

by the Company indicates that 37,000 of them could be served economically with gas in a five year period and others could be added later as new building develops in some of the more sparsely settled sections.

A large percentage of the construction in recent years has been single family dwellings as indicated by the following report of building permits from the office of the City Engineer:

Year	Number of Single Family Dwellings	Number of Multiple Units
1940	720	98
1941	882	23
1942	395	17
1943	1,278	30
1944	60	0
1945	329	12
1946	1,548	43
1947	1,561	167
1948	1,434	242
1949	1,716	120
	9,923	752

Q Mr. Hoke, I do not think we will take time to read all those figures. The table itself is self-explanatory. It shows, does it not, that between 1940 and 1949 the number of single family dwellings constructed raised from 720 to 1,716, and the number of multiple units in the same period was 19 in 1940 and 120 in 1949, with fluctuations in between?

A Yes, those are the new units added each year.

Q In each and every one of those years, yes.

A The Spokane Realty Board further reports that 73.2% of all the single family dwellings in the City are owner occupied.

BUSINESS AND INDUSTRY

Reference is frequently made to Spokane as being the "Hub of the Inland Empire", or the center of that territory within the United States lying within a radius of 150 miles of the city. Within this territory the principal production is agricultural crops, minerals and lumber and wood products. The principal agricultural crops are wheat, peas, fruit and vegetables. During the war years an aluminum reduction plant and a rolling mill were built on sites near the city because of the availability of electricity and these are presently being operated by private industry.

The city functions primarily as a distribution center for the surrounding territory. It supplies both the retail trade and industry. There is relatively little manufacturing. The two major industries are the processing of wheat and timber. There are, of course, a number of small factories which produce goods that are sold within the trade area.

(Go to page 386)

FUELS

COAL

Because sales for the city are not segregated, it is difficult to obtain reliable information as to the relative amount of the various fuels used in Spokane. Coal has long been the principal source of heat and energy in the city but it is rapidly losing its place to oil. Practically all of the coal for domestic use is shipped from Utah and Wyoming. There is considerable production of industrial coal in the State of Washington but this is supplemented to quite an extent by coal from British Columbia as well as from Utah and Wyoming. Because of the price and frequent interruptions of production most of the new heating installations are being designed for oil and many of the older installations are being changed to oil as replacements become necessary.

OIL

Most of the oil used in Spokane is shipped from California and the remainder comes from Montana. At the present time an oil pipeline is being built into the territory from Utah and it is expected that oil from that source will soon be available. Because of the distances it has to be transported, oil is relatively high in price in Spokane as compared with other sections of the country. However, due to the abundant supply at the present time and its cleanliness and flexibility of utilization as compared to coal, oil is rapidly becoming the popular fuel for domestic space heating and for industrial uses.

WOOD

Prior to the war years considerable wood was used for domestic heating and cooking. Due to the high cost of cutting and transportation it is now almost gone from the market. Sawdust and shavings furnished considerable energy for industry in past years but these too are assuming relatively less importance as fuels as other uses are being found for them.

ELECTRICITY

An important source of heat for cooking and water heating in Spokane is electricity. The tremendous amount of development of hydro-electric power in the northwestern part of the United States and the low rates together with the great amount of attendant publicity of these public power projects has been a great stimulant to the sale of electric appliances. Whereas there might have been a large surplus of electric power in this area, the coming of the light metals plants and the rapid increase in population has now caused a shortage. It appears that this condition will continue to prevail for the next several years.

GAS

The gas industry in Spokane has not kept pace with the growth of the community due to conditions beyond the control of the Company. The high cost of gas making materials has made it very difficult to compete with electricity for cooking and water heating and with coal and oil for space heating and industrial purposes. This in turn resulted in unprofitable operation and the business could not attract additional capital for new construction

which promised no greater return.

However, the introduction of natural gas at a competitive price should enable the Company to enter all these fields and realize a reasonable return on its investment. The gross revenue per mile of main should be considerably increased thus making profitable the extension of gas distribution facilities and the maintenance of dependable service to the consumers.

PRICES OF SOLID AND LIQUID FUELS

The price of competitive fuels delivered to the consumer in Spokane as of March 1, 1950, were as follows:

Kind	Price
Coal-Domestic (Stoker)	$ 17.35 per ton

That is a 2000 pound ton.

Coal-Industrial ($8.89 to $10.50)Average	9.90 per ton
Diesel Oil (Domestic-200 gallon deliveries)	.151 per gallon
Stove Oil (Domestic-200 gallon deliveries)	.166 per gallon
Diesel Oil (Tank Car Deliveries)	.136 per gallon
Bunker Oil (Tank Car Deliveries)	2.975 per barrel

SPOKANE VALLEY

.The territory between the east city limits of Spokane and the Idaho line along the Spokane River is generally known as the Spokane Valley. While the Valley territory has not been considered in the preparation of this brief, it offers a good market for natural gas whenever the supply is ample to serve the district.

The Spokane Valley has an estimated population of 40,000 most of which is within an area of about 50 square miles. It is traversed by two main highways, along which are several community centres having the business establish-

ments usually found in small towns. A good share of the population live on 1 or 2 acre tracts and are employed in the city of Spokane.

Because of the level terrain and the proximity to the railroads, it offers the best sites for any industries which may locate in this vicinity. At the present time it has an aluminum rolling mill, a paper mill, a cement plant, a clay products plant, a navy supply depot and several small vegetable canneries, as well as other smaller establishments.

The soil is gravel and the cost of installing a gas distribution system would be nominal.

SPOKANE GAS & FUEL COMPANY

Incorporation

The Spokane Gas & Fuel Company was incorporated in the State of Washington on November 15, 1909, and is a successor to the Spokane Falls Gas Light Company which began operations in 1887 and the Union Gas Company which was incorporated in 1905.

Operation

At the present time the Company has a franchise to distribute manufactured or natural gas in the City of Spokane, Washington. It has a manufacturing plant consisting of coal gas and carburetted water gas generating units with their accessory equipment and liquefied petroleum-air gas machines with related storage facilities. It also has a district holder station at which location are also the Company garages, warehouse, meter shop, etc. Its business office is in space rented in the central part of the city.

Manufacturing Plants

Presently the Company is producing 650 B.T.U. Butane-Air gas with 3 vaporizers having a total rated capacity of 125 MCF per hour.

The equipment which is now shut down consists of the following:

Type	Number	450 B.T.U. Daily Capacity
Horizontal Retort Coal Gas	96 Retorts	800 MCF
Carburetted Water Gas	2 Units	1600 MCF
		2,400 MCF

Gas Storage and Distribution

The Company has 2 storage holders with a total capacity of 400,000 cubic feet. It also has tanks with capacity for storing 80,000 gallons of butane or propane which can be converted into approximately 8,000,000 cubic feet of 1000 B.T.U. liquefied petroleum-air gas. The distribution system consists of 157 miles of main in varying sizes to a maximum of 12" in diameter. It is equivalent to 163 miles of main on a 3" basis.

Annual Production

The annual production of gas for a ten-year period is as follows:-

Q Perhaps you would just highlight that table, Mr. Hoke, would you please?

A You will note from '41 to '47 we were making coal gas and water gas. In 1945 we began to reduce the amount of coal gas and increased the amount of water gas. Then as soon as liquefied petroleum equipment and the liquefied petroleum itself became available, we changed over to butane-air gas.

Q That was in 1947?

A We were mixing them in 1947. We made the complete changeover on March 1st, 1948.

Q And now your operation is butane-air gas to the exclusion of coal gas and water gas?

A That is correct.

Q Thank you.

A

Annual Production

Year	Coal Gas-MCF	C.W. Gas-MCF	Butane-Air Gas MCF	Total MCF
1941	261,287	86,217		347,504
1942	260,427	131,780		392,207
1943	220,622	184,736		405,358
1944	246,116	192,263		438,379
1945	243,111	204,738		447,849
1946	203,573	246,689		450,262
1947	72,800	209,070	111,815	393,685
1948		20,330	286,065	306,395
1949			327,359	327,359
1950 Est.			306,595	306,595

A Note:

450 B.T.U. gas produced prior to November 1947
550 B.T.U. gas produced prior to 1947 to February 1948 inc.
650 B.T.U. gas produced since March 1, 1948.

Fuel Requirement and Supply

Fuel purchased for gas generation for a ten-year period is as follows:-

Q Now, this is purely informative for the information of the Board. You do not feel that it is necessary to read all those figures, do you?

A I do not.

Year	Coal	Coke	Oil	Liquefied Petroleum
	S.Tons	S.Tons	U.S.Gals.	U.S.Gals.
1941	21,294		181,574	
1942	21,357		321,507	
1943	22,171		529,968	
1944	23,193		514,265	
1945	23,445		520,692	
1946	23,207		674,178	
1947	11,109	990	355,667	696,120
1948	844	514	24,346	1,709,678
1949				2,037,225
1950 Est.				1,917,000

Q Then, perhaps, just having told the Board what that is, the amount of fuel purchased for gas generation for a ten-year period, we might proceed with the narrative.

A In 1941 and prior years the coal gas plant was operated to capacity and the remainder of the output was carburetted water gas. During the war years there were several sharp increases in the price of coal and the cost of labour incidental to the generation of coal gas. These conditions made it advisable to increase the production of carburetted water gas and supplement its production with coal gas. Then as the cost of generator fuel, boiler fuel and enricher oil continued to rise it became apparent that other means of generation must be installed. Liquefied petroleum gas equipment was purchased in 1947 and a gradual change-over was made. The coal gas plant was shut down in August 1947 and the production of carburetted water gas was discontinued in March, 1948. Since that time all gas produced has been butane-air gas.

The coal used was purchased from the mines in British Columbia and oil was shipped from California and Montana. Montana is also the source of the present supply of liquefied petroleum.

FORECAST OF THE UTILIZATION OF NATURAL GAS

For the purposes of this estimate, it is being assumed that natural gas of 1000 B.T.U. per cubic foot will be introduced into Spokane during the year 1951. The year 1952 would then be the first full year of natural gas distribution and the sales estimates have been prepared through the year 1956, or for the first five-year period.

The estimates are based on the number of customers presently served by the Company, those expected to be added to the existing distribution mains and those which will be connected to the new mains which will be paid by the Company. It is presumed that the price of gas to the consumer will be competitive with other fuels and therefore open new markets for gas in Spokane.

The rates now in effect for butane-air gas are given on Table 1.

ESTIMATE OF DOMESTIC USE

Last year (1949) the Company served 7,503 domestic customers, about half of which lived in multiple dwelling units. Only 14 domestic customers were using gas for space heating. Since December 31, 1946, there has been a decrease of 716 in the number of domestic consumers. The greatest percentage of this loss has been due to the razing of several old apartment buildings in order to convert the ground to business sites. Further loss was caused by master metering of some of the apartments catering

to transient guests and about 200 residential customers have changed to electricity.

In this estimate "General Use Customers" are considered to be those customers who use gas for purposes other than space heating. "Space Heating Customers" are those who use gas for space heating and may also use gas for other purposes as well.

It is estimated that by the end of the 5th year of natural gas distribution, 2,500 of the present domestic customers will have added space heating and changed to that classification. It is further estimated that an equal number of general use domestic customers will be added by the extension of the distribution system so that the number of general use customers will remain about the same as at the present time. This seems a rather conservative estimate but there is such a high saturation of electric appliances in the sections of the city into which the Company will extend its mains that it is believed that the adding of cooking and water heating business will be a rather slow process. On the other hand, with the advent of cheaper fuel it is believed that domestic space heating customers can be added with a minimum of sales promotion work. The number of space heating customers at the end of the 5th year is estimated at 10,000.

The average annual consumption of general use domestic customers is now 12.99 MCF on a 1,000 B.T.U. basis. Most of the new customers added will probably use gas for water heating as well as cooking and it is believed that the average annual use per customer will increase to 15 MCF by the end of the 5th year. The average

annual consumption of the 14 customers presently using gas for space heating is 91.14 MCF on a 1,000 B.T.U. basis. However these are very small units and on a comparative basis it is estimated that 10,000 customers will have an average annual use of 142.5 MCF of natural gas.

Based upon these assumptions the sales of natural gas for domestic purposes in the 5th year would be 1,536,000 MCF, 92.8% of which would be used for space heating.

The following table shows a comparison with the present sales: That Table shows that now the general use customers use 98.7% of the domestic gas, and heating 1.3, whereas at the end of the 5th year we estimate that only 7.2% will be general use and 92.8% heating.

	1949 Consumption Mfd. Gas MCF	Equiv. Natural Gas	% Dist.	5th Year Natural Gas Consumption MCF	% Dist.
General Use Customers	149,656	96,276	98.7%	111,000	7.2%
Space Heating Customers	1,963	1,276	1.3%	1,425,000	92.8%
TOTAL	151,619	98,552	100.0%	1,536,000	100.0%

Further details of this estimate are given on Table 2.

Q Well, it might be just convenient to look at Table 2 at the moment, Mr. Hoke, and to explain to the Board that it is built up on the same pattern as the other statements of domestic consumers that have been submitted by other companies, and the figures to which you make reference of 1,536,000 MCF are the total sales of domestic gas in MCFs?

A That is correct.

Q We are becoming more familiar with these Tables, and I think perhaps they require less explanation as we go on.

A ESTIMATE OF COMMERCIAL USE

During 1949 there were 671 general use commercial customers. This is 73 less than in1946. Most of the loss was due to closing of small establishments which were opened during the war period to serve military personnel and there has been some change over to electricity. The average annual consumption of these customers in 1949 was 58.43 MCF on a 1,000 B.T.U. basis. It is estimated that with cheaper fuel the number of general use customers can be increased to 800 and that the average annual consumption can be expanded to 110 MCF of natural gas.

At the beginning of 1949 there were 15 commercial space heating customers and 21 at the end of the year, or an average of 18. Although the present cost of heating with gas is considerably in excess of competing fuels, the Company would have much more of this business if it were not limited by the maximum monthly purchase clause of its butane procurement contract. This limitation could be overcome by the construction of additional storage facilities for use in the winter months but the margin of profit on the business would not warrant the investment. With an ample supply of cheaper gas it is estimated that the number of commercial heating customers would increase to 550 by the 5th year. At present the average consumption of these heating customers is 298 MCF on a 1,000 B.T.U. basis. These are selected customers and their establish-

ments are less than average in size. It is believed that 487 MCF of natural gas would be the average annual consumption of commercial space heating customers in the 5th year.

The following table shows a comparison with the present sales; there again showing that we are now selling 89.5% to the General Use Customers and 10.5% for space heating. At the end of the 5th year with natural gas we expect General Use will be 25% of commercial sales and Space Heating 75%.

	1949 Consumption Mfd. Gas MCF	Equig. Natural Gas	% Dist.	5th Year Natural Gas Consumption MCF	% Dist.
General Use Customers	70,635	45,913	89.5%	88,000	25%
Space Heating Customers	8,253	5,364	10.5%	268,400	75%
TOTAL	78.888	51,277	100.0%	356,400	100%

Q And these figures are given in more detail on Table 3, are they not?

A That is correct.

Q Which is your commercial customers' table, if I may call it that?

A Yes.

Q And it shows in the righthand margin the figure of 356,400 MCF, being the total annual commercial sales in MCF?

A That is correct.

Q And the computation follows the same form that we have used before?

A Yes.

Q All right, you may go on?

A ESTIMATE OF INDUSTRIAL USE

At present the Company classifies 48 customers as industrial, and their use of gas represents 10.3% of the total gas sales. Most of these are small consumers, using gas only for some particular part of their operation. A survey by the Company indicates that with a price competitive with other fuels, these customers would adapt the remainder of their operations to gas and other large consumers would change to this fuel. It is estimated that by the 5th year the number of customers would be increased to 121 and the annual gas sales would increase from the present 17,197 MCF on a 1,000 B.T.U. basis to 1,695,000 MCF of natural gas which would be 47.3% of the total sales.

A large percentage of goods manufactured in Spokane are sold within the trade area, with the possible exception of aluminum and lumber products. It is expected that the major consumers of natural gas will be laundries, creameries, bakeries, breweries, meat packing plants and manufacturers of insulating material - you will have to excuse the typing - paper, cement, clay products and soap. It also seems likely that gas could be supplied to an asphalt plant, the city's central hearing plant and incinerator.

The asphalt plant is a summer load and since the other prospective customers already have other fuel-burning equipment, it is believed that at least 1,100,000 MCF of the 5th year estimated industrial sales could be obtained on an interruptible basis.

Details of the industrial sales estimate are shown on Table 4.

Q Table 4 follows the same pattern and I see down in the lower

righthand corner the total annual firm sales 595,000, to which should be added the total annual interruptible sales to give you a commercial total of 1,695,000 which represents 47.3% of your total sales.

A That is correct.

Q You observe that there is no space heating at the present time for industry, and you do not expect any until 1951?

A That is correct.

Q And there is no interruptible sale expected?

A Not at the present time.

Q Until 1952?

A That is right.

Q Why are there no sales of that character?

A We just cannot compete on the cost basis.

Q If you will now go on with the narrative?

A ESTIMATE OF TOTAL ANNUAL SALES AND SENDOUT

A comparison of the present sales with those estimated for the 5th year of natural gas is shown in the following table, which is just a recap. of the preceding items.

Q Buw which does show that the industrial sales are the conrolling factor?

A In natural gas estimates,yes.

Q Yes.

	1949 Mfd. Gas MCF	Equivalent Nat. Gas MCF	% Dist.	5th Year Nat. Gas MCF	% Dist.
Domestic	151,619	98,552	59.0%	1,536,000	42.8%
Commercial	78,888	51,277	30.7%	356,400	9.9%
Industrial	26,457	17,197	10.3%	1,695,000	47.3%
TOTAL	256,964	167,026	100.0%	3,587,400	100.0%

The Company experienced considerable increase in the amount of unaccounted for gas when a change was made from coal and water gas to butane-air gas. Particular attention is now being given to leak surveys with favourable results, and it appears that considerable improvement may be expected within the next year or so. The total sendout of butane-air gas in 1949 was 325,688 MCF, leaving 68,724 MCF unaccounted for.

In the fifth year of natural gas distribution the unaccounted for gas is estimated at 148,000 MCF or qbout 3.96% of the sendout.

Further details of the estimate of total sales and sendout are given on Table 5.

Q Now, Table 5, Mr. Hoke, is really a computation made up on the basis of the commercial, domestic and industrial tables to which we have made reference?

A That is correct.

Q And it simply brings those figures all together and sets them down on one page, which is the total consumption of natural gas for all uses?

A That is right.

MAXIMUM DAY REQUIREMENTS

It is recognized by all members of the gas industry that the building of its sales load is one of the major problems of operation. At the present time, space heating is the business which probably can be most easily attached. However, this business alone has such a poor load factor that it would not enable either the pipe-line or distributing companies to make the most advantageous use of their facilities. While Spokane is not a manufacturing centre, it is believed that gas sales for non-space heating purposes will approximately equal those for space heating. In addition, it is estimated that most of the industrial load could be cut off on peak days for reasons discussed under the caption "Estimate of Industrial Use". On this basis, the maximum day requirement is estimated at 22,122 MCF for the 5th year. Although it has not been given consideration in the preparation of this estimate a limited amount of "peak shaving" might be accomplished by the use of liquefied petroleum gas from the present facilities of the Company.

Details of the maximum day requirements are shown on Table 6.

(Go to page 402).

Q And Table 6 is no more and no less than a table which shows how the figure of 22,122 Mcf.s for the 5th year, being the maximum day requirement, is arrived at?

A That is right.

THE CLIMATE OF SPOKANE, WASHINGTON.

Since Spokane is not an industrial city a substantial portion of the natural gas distributed in the city will be used for space heating. For this reason the climate of Spokane is a factor to be considered and official meteorological data appears on Table 7.

The number of degree days in Spokane is greater than in the coastal cities of Oregon, Washington and British Columbia but considerably less than in the Canadian cities to the north or in the cities in Montana. Over a 50 year period the average annual degree days in Spokane is 6,356. January is the coldest month with the degree days varying 852 to 1,750 with an average of 1,154. The average temperature for January is 27° F. and the lowest temperature recorded is -30° F. in January 1888. It is the practice of heating engineers in the city to make heating installations based upon a minimum temperature of -10° F.

The frequency of low temperatures is as follows:

Once	in 3 years	-15° F.
Once	in 2 years	-13° F.
Once	in 1 year	- 9° F.
Twice	in 1 year	- 7° F.
Three times	in 1 year	- 4° F.
Four times	in 1 year	- 1° F.
Five times	in 1 year	+ 1° F.

Q And following on that page you have just read, being 15, there

is Table 1. We have not talked about that, have we, Mr. Hoke?

A Those are our present rates.

Q And the therm is 100,000 BTUs?

A That is correct.

Q And they show the rate per month and the minimum charge being your domestic, commercial and industrial rates? These prices are in effect as of January 1st, 1950?

A Yes, presently in effect.

Q What does "optional rate" mean, about the middle of the page?

A Our domestic rate and commercial rate and industrial rate are all-purpose rates. However, we have an optional rate which covers space heating, water heating, illumination and refrigeration purposes.

Q And it is confined to those purposes?

A Yes.

Q And there follows a flat rate and that is described as being for limited demand automatic storage water heaters and refrigerators?

A That is a rate which was put in a number of years ago to meet electric competition. Since there are more improved storage water heaters today there are very few customers using the flat rate because it is a very limited purpose.

Q Mr. Hoke, if we turn to Table No. 5 which is the table which adds together the tables which immediately precede it, and is the total consumption of natural gas over all the years I observe that the total industrial, firm and interruptible, is 1,695,000 or 47.3 per cent of your total sales?

A That is correct.

Q Now what would be the effect on that estimate at the end of the 5th year if the average cost of all the natural gas was

30 cents per Mcf.?

A I think it would remain at about that figure.

Q You would, as another witness has said, maintain your volume?

A That is correct.

Q What would happen if it went to 35 cents per Mcf.?

A Well I think in Spokane we could maintain our volume at that figure.

Q And at 40 cents?

A I doubt if we could retain or obtain the interruptible business at that rate.

Q And that, of course, is a very important component part of your total annual sales being 1,100,000?

A Yes, it is.

Q Your position is slightly different from the condition of the gas companies in Seattle and Portland because the price of your fuel oil is greater than theirs?

A That is correct.

Q Because you bring it in from Montana by train it costs 2.975 dollars per barrel?

A That was the price quoted me by the oil company.

Q I suppose it follows that the higher the oil price, the more easily gas can compete?

A That is correct.

CROSS-EXAMINATION BY MR. BRUCE SMITH.

Q Mr. Hoke, I cannot make comparisons between your figures as to your anticipated markets with any submission that was furnished by the Westcoast company because, so far as I know, either the Westcoast has got no figures or they

have not seen fit to present them to this Board. Have you seen any officials of Ford, Bacon & Davis in connection with markets for natural gas in Spokane? Have they been around to see you?

A No, I have not.

Q They have not been there. Well, you referred to Spokane as being the nearest large American city to the gas fields in Alberta, which would be a good market for natural gas for a period of years. I have no quarrel with your statement, Mr. Hoke. I assume it is correct. Are you familiar with the application that has been made to this Board for an export permit by the Westcoast Transmission Company and the route which it is proposed its pipe line will take?

A Only from newspaper items.

Q Then you will accept my statement that according to their Exhibit No. 52 and the map attached thereto, they propose to take their pipe line from near Edmonton to Jasper, through the Yellowhead then to Blue River, Kamloops, Princeton, Hope and Huntingdon. Then they split up there and carry it west to Vancouver and south to Seattle, Tacoma and Olympia. According to their Exhibit 52 their pipe line does not reach at all the city that you have described as being the nearest large American city to the gas fields in Alberta, which would be a good market for natural gas for a long period of years. They appear to by-pass Spokane entirely?

A That is the way I understand it from the newspaper clippings.

Q So that if Spokane hopes to get natural gas, it apparently cannot look to the Westcoast Transmission Company for the delivery of the gas for distribution by your system, if those are the facts?

A If those are the facts.

Q Thank you.

MR. D. P. McDONALD: No questions.

MR. NOLAN: That is all, then. I will proceed with the next witness. I think I will call Dr. Sutherland, if I may, please. Have copies of Dr. Sutherland's submission been distributed? I hear they have been distributed and are in the possession of the Board. Dr. Sutherland will speak on behalf of the Consolidated Mining & Smelting Company of Canada, Limited at the request of the applicant company.

BRIAN PORTER SUTHERLAND, having been duly sworn, examined by Mr. Nolan, testified as follows:

Q Dr. Sutherland, you are appearing before this Board on behalf of the Consolidated Mining & Smelting Company of Canada, Limited which has operations at Trail and Kimberley, British Columbia?

A Yes, sir.

Q And what is your connection with that company?

A I am Chairman of the Research Board.

Q What does that mean, in a few words?

A The Research Board has the responsibility of the general control and direction of the research and development that the company undertakes.

Q Yes. Have you a staff under you?

A We have a research staff, yes.

Q Of how many people?

A Chemical engineers.

Q How many people have you on your staff?

A About 70 at the present time.

Q And they are trained personnel, are they?

A Yes, the majority of them are engineers.

Q And would you please tell us what is your academic background?

A I have the degree of Bachelor of Applied Science in Chemical Engineering, from the University of British Columbia, and Doctor of Philosophy in Chemical Engineering from the University of McGill.

Q How long have you been connected with the Consolidated Company?

A For two years.

Q Has most of your experience been along the line of research?

A The whole of it.

Q Your brief indicates the general operation of your company, does it not?

A Yes.

Q Perhaps you would tell me in a word what does the Consolidated do?

A Fundamentally, it operates the Sullivan Mine at Kimberley, producing lead and zinc from that mine. We also carry out chemical and fertilizer operations based originally on the sulphur also in the ore from Kimberley.

Q And those are the two main operations, the chemical being a by-product operation?

A Originally it was a by-product.

Q Originally it was a by-product but it is assuming more importance?

A That is correct.

Q As time goes on. You were requested, Dr. Sutherland, or asked, if you would come before this Board and make a statement with respect to your company and you have agreed to do so?

A Yes.

Q And this document which has been circulated is the result of that investigation to give a memorandum and submission?

A That is right.

STATEMENT PREPARED BY THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED PUT IN AND MARKED EXHIBIT 10.

Q And if you would give it now, sir. I would ask Dr. Sutherland to proceed to read it to the Board, if he would, please.

A PROVINCE OF ALBERTA

Before the

PETROLEUM AND NATURAL GAS CONSERVATION BOARD

NATURAL GAS REQUIREMENTS OF THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA, LIMITED, AT TRAIL AND KIMBERLEY, B.C.

Facts about the Company.

The Consolidated Mining and Smelting Company of Canada, Limited, was incorporated under the Companies Act of the Dominion of Canada in 1906, and has operated a smelter at Trail, British Columbia, since that time. The original smelter was constructed in 1896 and the Trail smelter is the only surviving smelter in the Province of 19 started near the turn of the century.

In 1910 the Company purchased the Sullivan Mine, approximately 200 miles by road to the east, at Kimberley, B.C. The Company's growth during the last quarter of a century has been largely attributable to the discovery by the Company's engineers of the satisfactory method of separating lead and zinc from the complex lead-zinc-iron ores of that mine. For many years it has been the

policy of the Company to carry forward an active research program designed to develop new processes and products and to improve efficiency of existing operations.

In 1923 the capacity of the concentrator at Chapman Camp, near Kimberley, was 2,500 tons per day. Today the concentrator has a daily capacity of 8,500 tons.

In 1930 plants were constructed at Trail to make chemical fertilizers. These plants are the chief supplier of chemical fertilizers used in Alberta and the other Western Provinces. Approximately 70,000 tons were sold in the Prairie Provinces during 1949, Alberta's allotment being approximately 27,000 tons. The sales on the Prairies from June 1949 to June 1950 will be 85,000 tons, and in the near future, when supply catches up with demand, the Company expects the annual sales on the Prairies from the chemical plants at Trail will total 100,000 tons.

Today the Company produces annually over 300,000 tons of the base metals lead and zinc, which is about 10% of the world's requirements of these metals. It leads also in the production of silver in Canada, with 8,000,000 ounces a year. Its chemical plants at Trail produce annually about 500,000 tons of chemical fertilizers. It also produces gold, tin, cadmium, bismuth, indium and antimonial lead. Much of this production is sold in the United States, thus the Company plays an important part in Canada's foreign exchange position by bringing into this country United States dollars.

The total sales of all products

taken into the Company's accounts in 1949 were over $120,000,000.00, constituting a significant part of British Columbia's manufacturing production, which in 1947 had a gross value of $858,285,000 according to the Dominion Bureau of Statistics.

I might add here that the sales figure quoted of $120,000,000.00 includes sales from the Calgary plant and from the Gold Mines, Con Mine, up in the Yellowknife, but far the larger proportion of those sales come from Trail. The 1947 sales which we have for British Columbia's manufacturing production is the latest available, but I think we can probably say that the Trail plant, the output of the Trail plant, constitutes about 10% of British Columbia's manufacturing production.

Communities directly dependent upon the Company in British Columbia have a population of approximately 32,000, most of whom are in the vicinities of Trail, Rossland and Kimberley. The population of Trail is estimated at approximately 12,000, of Rossland 4,500, and of Kimberley and its environs 7,500.

Trail is located approximately six miles north of the International Boundary, and one hundred forty-five miles west in a direct line from Crows Nest Pass on the Alberta-British Columbia boundary. Kimberley is sixty miles west, in a straight line, of Crows Nest Pass. Both communities are served by the Kettle Valley line of the Canadian Pacific Railway Company, Kimberley being on a branch line sixteen miles from Cranbrook.

Dr. B. F. Sutherland,
Dir. Ex. by Mr. Nolan.

Forecast of Industrial Use of Natural Gas

The Company's operations, both at Trail and Kimberley, call for large quantities of fuel consisting of oil, coal and coke.

The estimated consumption of oil and coal for 1951, (communities directly dependent) and the approximate equivalent volume of natural gas which could be used to replace these fuels are as follows.

The reason we use 1951 is because a number of changes are in progress in the Plant at the present time, so that this year and earlier years are not representative of what they will be in 1951 and thereafter.

	Annual Consumption	Equivalent Natural Gas
1. Oil		
Star Oil	305,000 gal.	45,000 MCF.
Bunker C Oil	1,780,000 gal.	285,000 MCF
2. Pulverized Coal at Tadanac and Warfield	65,000 tons	1,360,000 MCF.
3. Mine Run Coal at Tadanac Plants	4,700 tons	100,000 MCF.
4. Stoker Coal at Kimberley	47,000 tons	1,000,000 MCF.
TOTAL -		2,790,000 MCF.

Assuming a suitable price, the minimum assured consumption of natural gas at the metallurgical and chemical works at Trail would be in the order of one billion, eight hundred million cubic feet per year. There would also be an initial consumption of about one billion cubic feet per year at Kimberley. An approximate

two billion, one hundred million cubic feet of gas for slag fuming could also be used at Trail, but a decision regarding consumption of this gas is dependent upon considerations which require research, and a forecast is not possible at this time. There is, at present, an annual consumption of 100,000 tons of coal for slag fuming. Thus the total quantity of natural gas for which there is a possible market at Trail and Kimberley is in the order of five billion cubic feet per year.

Practically all of the quantities of gas mentioned would be consumed at a substantially uniform rate regardless of weather conditions, that is to say, there would be a high load factor.

That is to say, there would be a higher load factor.

The Company's operations are expanding generally, and if prices and conditions of delivery are favorable, the Company is a prospective customer for large quantities of gas for many years.

Q Dr. Sutherland, what is slag fuming?

A Slag fuming is an operation whereby lead and zinc, which remain in the slag from the blast furnace operation, are reduced and volatilized. At the present time the process is to blow through the molt and slag powdered coal with air, and those two metals are volatilized and collected.

Q And the company has under consideration now an expansion of this process which might require the use of more natural gas?

A What we refer to is that we could possibly substitute natural gas for the present pulverized coal.

Q In this operation?

A In that particular operation.

Q But that has not yet been decided?

A To our knowledge, no one has yet done that so we are not sure whether it could be developed.

Q But apart from that we have the 1,800,000,000 cubic feet per year being used at the metallurgical and chemical works at Trail now?

A Yes.

Q What use is that put to in those works? I mean, what use would it be put to, the natural gas?

A For heating, drying materials, roasting.

Q And there is also a consumption of one billion cubic feet at Kimberley?

A Yes.

Q And what would the natural gas be used for there?

A Most of it for steam generation.

Q So we have at the moment 1,800,000,000 at Trail and 1 billion at Kimberley, and also a present consumption of 100 thousand tons as a substitute for coal for slag fuming?

A That is right.

Q That is something that we can anticipate, is it?

A Yes. Given an attractive price we would undertake the development work. Our research engineers think it can be carried out successfully.

Q It is a use for natural gas?

A Yes.

Q So that we can come to a total now, evening limiting this

2,100,000,000 cubic feet for slag fuming at Trail, to 2,900,000,000, being the difference between 5 billion subtracting the 2,100,000,000 from it?

A Well, we have a figure of 2,000,790,000.

Q Which is approximately the same as my figure?

A Yes.

Q Thank you very much.

CROSS-EXAMINATION BY MR. FENERTY.

Q Dr. Sutherland, you say on page 2, "In 1930 plants were constructed at Trail to make chemical fertilizers. These plants are the chief supplier of chemical fertilizers used in Alberta and the other Western Provinces." I was under the impression a good deal of the chemical fertilizer used in Western Provinces came from the Calgary plant south of the city. Am I wrong in that?

A That is not correct, sir.

Q What is that?

A That is not correct, sir.

MR. NOLAN: I think Mr. Fenerty is under a misapprehension about that. Evidence was produced that the fertilizer product from Calgary Nitrogen Plant was not used locally but was exported.

THE WITNESS: That is correct.

Q MR. FENERTY: I knew a large part of it was, but it is the Trail product that is used on the Prairies, and the Plant here export?

A Yes, sir. The reason for that is that the Trail plant is the only plant that makes phosphates.

Q And is it contemplated that if natural gas is piped into Trail that it will be used there as a raw material, fertilizer similar to this made in the plant here?

A Well, we have not taken any account of that in t hese estimates. We have taken no account of such a development in these estimates. We do not have it in mind at the present time.

Q Do you anticipate to use that natural gas as a raw product at Trail?

A Technically it could be done but it would be a matter of policy and I am not able to say that at the moment.

Q At the moment you have no reason to suppose that it would affect the Calgary operation?

A Oh, no.

Q That is what I wanted to get, thank you.

CROSS-EXAMINATION BY MR. S.B. SMITH:

Q Dr. Sutherland, I suppose it is at least a distinct possibility that residents in your communities might desire to use natural gas as a space heating and cooking fuel?

A Yes, sir.

Q You have not taken that into account, you are simply looking at the industrial use?

A That is correct.

Q Now, Dr. Sutherland, you have here quite important communities, totalling, according to your figures, 32,000 people, and I think probably this is correct, that you have in your operations the biggest industrial operations in all of Western Canada. Would that be correct, do you think?

A I think it would be correct. It is rather difficult to define.

Q You can not at the moment think of any larger industrial operation than that of Consolidated?

A No, I can not.

(Go to page 417)

Q And you are only 145 miles west of the Crows' Nest Pass?

A Yes, in a direct line.

Q And yet, according to Exhibit 52 of the Westcoast Transmission Company, who proposed to build a pipe line through the Yellowhead Pass to Princeton, Huntingdon and then to Vancouver and Portland, they do not propose, apparently, to build a pipe line in the vicinity of Trail at all, or to serve Trail. If they build, according to that route, then Trail will not be supplied with natural gas, that is obvious, isn't it?

A It would appear so.

CROSS-EXAMINATION BY MR. D. P. McDONALD.

Q Dr. Sutherland, would you be good enough to tell me, referring to page 4, what Star Oil is?

A It is a light grade of fuel oil.

Q And where is that obtained by your company?

A It is purchased from Imperial Oil Company.

Q Purchased from Imperial Oil Company?

A Yes.

Q And does it have its origin in the Alberta oil fields?

A That I do not know.

Q You do not know?

A No.

Q Now, with regard to Bunker C oils, is that also purchased from the Imperial Oil?

A Yes.

Q Do you know whether that is Alberta oil, originates in Alberta refineries of Imperial OilCompany?

A That I do not know.

Q Do you think you could find that out for us?

A Yes, I am sure that could be found out.

Q And let us know for the record, if you do not return?

A Yes.

Q Now, when you are doing that, have you any idea of the price that is paid for the Star oil, and could you give us the value of the 305,000 gallons?

A The gross value of the 305,000 gallons is something under $60,000.00.

Q Yes. And the Bunker C oil?

A The gross value of the 1,780,000 gallons is something under $250,000.00. Those figures do not include handling charges within our own operation.

Q They do not include loading and storage in your own plant?

A No.

Q Unloading and storage in your own plant?

A No.

Q And what is the principal use of the Star oil in your plant, in your processing?

A It is used for heating in various metallurgical operations.

Q What is the principal use of the Bunker C oil?

A It is also used for heating. Bunker C oil is a heavier oil and requires heated storage, and is more difficult to distribute, and is generally only used in operations which require a larger quantity. The Star oil is more conveniently used where smaller quantities are required. That is why the Star oil is used in certain parts of the operation and the Bunker C in the other.

Q Is the Bunker C oil used mostly under furnaces or for the generation of steam, or is it for direct heat?

A No, the oil is not used for the generation of steam?

Q It is not?

A No, it is used for heating in various phases of our metallurgical operations.

Q It is used in processing rather than through steam or power?

A Yes.

Q Now, these consumption figures of Star oil and the Bunker C oil, are these just the amounts of oil that can be displaced by gas, or the total oil purchased by the company?

A The total oil purchased by the company.

Q The total oil purchased by the company?

A Yes.

Q And do you say that any use of oil you have can be replaced or displaced by gas?

A Substantially completely, yes.

Q Substantially completely?

A Yes.

Q Now, we come to pulverized coal at Tadanac and Warfield, where is that coal mined, or where is it purchased?

A In the Crows' Nest Pass area.

Q In the Crows' Nest Pass area?

A Yes.

Q And can you give me some idea of the value of that 65,000 tons, or you can give me the per ton cost?

A You will notice that is pulverized coal.

Q Yes?

A It has to be dry and pulverized. The cost is approaching $10.00 per ton as applied.

Q As applied in the processing?

A Yes.

Q That is, that would include the mine cost, plus transportation, plus drying, plus pulverizing?

A. Yes, sir.

Q And the mine run coal at Tadanac, where would that coal be purchased?

A That is also purchased in the Crows' Nest Pass.

Q And the cost of that coal would be mine cost plus transportation?

A Yes.

Q Can you give me an average value of the price per ton of that coal delivered at Trail?

A It would not be very much different from the pulverized coal. It includes a number of various types of coal, generally somewhat higher priced than the slag coal we are able to use for pulverizing.

Q And the average price of $10.00 would be - -

A - - not far off.

Q Not far off?

A No.

Q Now, the stoker coal at Kimberley, where would that be purchased?

A The same source. All our coal comes from the Crows' Nest Pass.

Q All your coal comes from the Crows' Nest Pass?

A. Yes.

Q What would be the value of that coal at Kimberley?

A It would be somewhat less than the other coal because of the lower freight haul.

Q Would it be $8.50 or $9.00 a ton?

A Yes, it would be no more than that at the present time.

Q Now, can you give me this information as to what portion of this coal is purchased in the Crows' Nest Pass area situated in Alberta and the Crows' Nest Pass area situated in British Columbia?

A Well, offhand, I am sorry, I could not give you the information at the present time.

Q You cannot?

A No, that varies somewhat from year to year.

Q Yes. Well, is it fair to say that the Consolidated Mining & Smelting Company has a direct interest or has an operating interest with International Coal Company at Coleman and the McGillivray Creek coal mine in the vicinity of Coleman, Alberta?

A I am not familiar with any arrangements they may have with those companies.

Q Now, can you tell me this, has there been any difficulty in the last year or so in obtaining this supply of Star oil and Bunker C oil that you require in your processing?

A Not recently, as far as I am aware.

Q Not since there has been an adequate production or a reasonable amount of production of oil in Alberta?

A That is my understanding.

Q That is your understanding?

A Yes.

Q And there has not been, or can you tell me if there has been any interruption in the supply of coal at Trail over the last three or four years, or do you recollect?

A I do not recollect that we had any interruption. We had difficulties from time to time, but we maintain substantial stocks so that our operations have not actually been

interrupted due to shortage of fuel.

Q Now, do you feel that the operation you are carrying on now at Trail in this processing in which you use Star oil, Bunker C oil, and pulverized coal, results in an efficient operation which enables you to sell your product in the world market at a reasonable profit?

A We made a reasonable profit in the last few years, certainly.

Q You have mentioned here "assuming a suitable price for gas", have you made any calculation as to what would be a suitable price for the purposes of your company, at, say, Trail, in one instance, and Kimberley in the other?

A Well, we could pay generally perhaps, or I might say that generally, perhaps, 30 cents for natural gas would be attractive, assuming other conditions were suitable, but at a price of perhaps 40 or 45 cents it would certainly limit the application of gas.

Q Now, you referred to 100,000 tons of coal that had presently been used for slag fuming, is that pulverized coal, that is, the 65,000 tons referred to in item 2 of the paragraph above?

A Yes, sir.

Q And that is also purchased in the Crows' Nest area?

A It is identical coal.

Q It is identical coal?

A Yes.

Q And a similar price?

A Yes.

Q We have had at times here, Dr. Sutherland, discussions of the percentage which the cost of fuel must bear to the total cost of manufacturing operations. I was wondering if you can tell us in the smelting operations, the refining oper-

ation, and the manufacturing operation, you have at Trail, what percentage of your cost is the cost of the fuels?

A I do not have anything accurate on that at the present time.

Q Have you any general idea about it?

A No. Our last year's annual report, we have figures on manufacturing supplies, fuels, etc. purchased totalling $17,600,000.00.

Q Well if you haven't it readily handy, it would be very hard to get at it.

MR. FRERE: Mr. Chairman, Mr. McDonald asked Dr. Sutherland to introduce into the record a statement as to where the Star oil and the Bunker C oil used in our plant is purchased. Dr. Sutherland hopes to return to Trail tomorrow and I wondered if it would be satisfactory for Mr. Woodford, the General Superintendent of our Calgary plant, to have him introduce that statement into the record?

MR. D. P. McDONALD: It would be quite all right as far as I am concerned, Mr. Chairman.

THE CHAIRMAN: Yes.

DIRECT EXAMINATION BY MR. NOLAN.

Q There is just one thing I want to ask Dr. Sutherland, if I may. You are familiar with the operation at the Nitrogen Plant here, of course?

A Yes.

Q They use natural gas?

A Yes.

Q In their operation to make their fertilizer, or what do they make?

A They make ammonia and ammonium nitrate.

Q Ammonia and ammonium nitrate?

A Yes.

Q And for that purpose they use the four component parts of the natural gas, do they, methane, ethane, propane and butane?

A Primarily they use methane. They could operate just as successfully without ethane, propane and butane.

Q And what about your processing at Trail, assuming for the purposes of this that you were provided with natural gas, what would you use in your processing there?

A We could use any fuel gas that was supplied, but methane would be entirely satisfactory without any higher hydrocarbons present.

Q Well, then, that operation does not differ in any respect from the one here?

A Not in respect to the gas we can use, no.

Q No, in the chemical industry, I understand that butane and propane - or propane and butane, I should put them in that order - are the most important of these elements of natural gas, is that right?

A Well, to make chemicals other than ammonia, such as is produced at the Alberta Nitrogen Plant.

Q Well, for chemical industry, the important elements of natural gas are the propanes and the butanes?

A yes, sir. The organic chemicals derived from natural gas use the higher hydrocarbons, propane and butane, that is correct.

Q And you would need a gas transmission line to get those propanes and butanes to where they could be used? No?

Excuse me, sir. I have to be instructed, sir, so just excuse me for a moment. Well, you know what I am talking about, do you, Dr. Sutherland? As the gas comes out of the ground it has four elements. Would you tell me what they are?

A Well, I presume you are referring to methane, ethane, propane and butane, which are normally gaseous.

Q Now, what goes into the pipe line?

A Well, the gas that will go into the pipe line will be almost entirely methane.

Q And what is that used for?

A That is used, would be used at Trail in the process we are proposing as a source of heat. It is used at our Alberta Nitrogen Plant here outside of Calgary to make ammonia.

Q Now, what happens to the other products, the other constituents of the gas?

A The other constituents of the gas could be used to make various organic chemicals.

Q Here or at Trail?

A Anywhere.

Q Anywhere?

A Yes, but we are not making any of those chemicals either here or at Trail, nor do we at the present time expect to do so.

Q And the constituent that you use is the methane?

A Yes.

Q In your operation at Trail?

A Yes.

Q That you would use?

A Yes.

Q That is the valuable thing for you?

A Yes.

Q And the valuable thing here at Calgary at the Nitrogen Plant?

A Is also the methane.

Q I am told that is one of the few uses other than burning?

A Yes, sir, that is right.

Q Now, propane and butane under this proposed operation would be available here to build chemical industry in Alberta?

A That is right. If a use can be found for the methane, then the propane and the butane can be made available to anyone else who wishes to use them to make chemicals.

Q I am sure that is highly satisfactory.

THE CHAIRMAN: Thanks very much, Dr. Sutherland. We will now adjourn.

(Hearing adjourned to 9.30 A.M. June 2nd, 1950.)